

APPENDIX 41

Finance Docket No. 30186, et al.

APPENDIX B

**A MASTER MITIGATION POLICY AND PLAN
FOR THE PROPOSED TONGUE RIVER RAILROAD PROJECT**

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
2.0 LAND USE IMPACT MITIGATION	2
2.1 Agricultural Operations	3
2.1.1 General	3
2.2 Impacts to Fort Keogh Livestock and Range Research Station (LARS)	7
2.2.1 General	7
2.2.2 Specific Mitigation Concerns and Commitments	7
2.3 Impacts to the Miles City Fish Hatchery	10
3.0 SOCIAL AND ECONOMIC IMPACT MITIGATION	11
3.1 General	11
4.0 TRANSPORTATION IMPACT MITIGATION	12
4.1 General	12
4.2 Construction Impacts	12
4.3 Operational Impacts	14
5.0 AIR QUALITY IMPACT MITIGATION	15
5.1 General	15
6.0 NOISE IMPACT MITIGATION	16
6.1 General	16
7.0 SAFETY IMPACT MITIGATION	17
7.1 General	17
7.2 Construction Safety	18
7.3 Emergency Situations	18
8.0 HYDROLOGY AND WATER QUALITY IMPACT MITIGATION	22
8.1 General	22
9.0 AQUATIC ECOLOGY IMPACT MITIGATION	24
9.1 General	24

Finance Docket No. 30186, et al.
Appendix B
Page 3
TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
10.0 TERRESTRIAL ECOLOGY IMPACT MITIGATION	26
10.1 General	26
10.2 Wildlife	27
10.2.1 Mitigative Measures	29
10.3 Vegetation	30
11.0 CULTURAL RESOURCES IMPACT MITIGATION	34
11.1 General	34
12.0 SUMMARY	35

**A MASTER MITIGATION POLICY AND PLAN
FOR THE PROPOSED TONGUE RIVER RAILROAD PROJECT**

1.0 INTRODUCTION

Environmental impacts associated with the construction and operation of the Tongue River Railroad are discussed in the environmental documentation prepared for this proceeding. Numerous suggested mitigation measures to be applied to avoid or lessen impacts are also presented in the documentation. It was recognized, during preparation of the Draft Environmental Impact Statement (DEIS), that final and more specific mitigative measures would have to await comments on the DEIS and testimony at the proceedings. With these aspects of the proceedings now completed, it is appropriate to consider specific mitigative measures that can be applied in this case. The purpose of this Master Mitigation Plan is to provide a more definitive framework for mitigation planning and to provide ultimately for the just compensation of economic and environmental loss due to the Tongue River Railroad Company (TRRC).

The plan is divided into various sections, conforming to the topics discussed in the environmental documentation. Potential impacts and suggested mitigative measures are discussed for each discipline. It should be noted that many of the topics presented during the proceedings relate to site specific concerns of individual landowners. To the extent that these issues relate to environmental matters, they are discussed in this document. However, the Section on Energy and Environment (SEE) recognizes that many of the site specific concerns will be the topics of negotiation between the Applicant and affected landowners.

The Section of Energy and Environment emphasizes that this plan is not the only method available to protect the interests of the affected landowners or other affected parties. Many of the specific mitigation measures mentioned in the hearings and in comments on the draft mitigation plan are subject to negotiations for right-of-way purchase or easements. The State of Montana's concerns have been addressed in this document. However, the State retains the right to expand these mitigation measures in granting easements across state lands.

Similarly, the areas subject to landowner/railroad negotiations have been identified in this and other documents and mechanisms have been suggested to facilitate right-of-way discussions. Montana statute protects the integrity of those negotiations. Montana law provides for the appointment of qualified, disinterested condemnation

commissioners, should right-of-way negotiations between the parties be unsuccessful. The commissioners are required to assess compensation at current, fair, market value (MCA 70-30-207, 70-30-302). There is significant latitude available to the commissioners to provide compensation to the affected landowners to cover direct acquisition of land, severance, and depreciation damages for non-contiguous lands.¹ A combination of provisions outlined in this mitigation plan and the negotiation process, protected by Montana law, will place the affected landowners on strong footing with regard to addressing the environmental impacts to their property.

2.0 LAND USE IMPACT MITIGATION

Land use impacts can be divided into three groups for mitigation purposes: (1) impacts to agricultural operations; (2) impact to the Livestock and Range Research Station (LARRS); and (3) impacts to the Miles City Fish Hatchery. Many of the procedures and measures implemented under this topic will be useful under other disciplines, as well. As a result, Land Use is considered to be of primary importance in terms of both impact and mitigation. This is underscored by the primacy of agriculture as the regional land use and economic base, not only for the Tongue River/Otter Creek area, but on a regional and statewide basis. It should be noted that the level of specificity varies in terms of mitigation suggested for the three groups listed here. This is due in part to the varying requirements placed on the applicant by federal law.

The LARRS is federal property and subject to Department of Agriculture easement procedures and requirements. TRRC's easement application for the proposed crossing of LARRS was filed with the Department of Agriculture in January 1985. The application for an easement across the facility constitutes an independent permitting process and requires the level of detail presented in this Draft Master Mitigation Plan. Similar efforts will be undertaken with the State of Montana when easement applications are filed with the Department of State Lands and the Department of Fish Wildlife and Parks. The same specificity will undoubtedly result from negotiations with the 39 individual ranchers along the proposed right-of-way (ROW). As previously noted, that negotiation process is subject to provisions in Montana law concerning eminent domain. At this point, it would be inappropriate to bind either the railroad or an individual landowner to detailed measures that either party might want to change at some future date.

¹Meagher County Newlan Creek Water District v. Walter, 169 M 358, 547 P2d 850 (1976); State Highway Commission v. Renfro, 161 M 251, 505 P2d 403 (1973); State v. Hoblitt, 87 M 403, 288 P 181 (1930).

2.1 Agricultural Operations

2.1.1 General

The major goal of all mitigation measures directed at individual agricultural operations should be to minimize the effect of the railroad on day-to-day operations of the existing ranches. The negotiations and planning process should focus on the following objectives:

- (a) Maintaining the integrity of each operation as an independent agricultural enterprise.
- (b) Maintaining the economic vitality and productivity of each operation at levels generally approximating the current situation.
- (c) Developing and implementing measures which will preclude the necessity for significant time/labor increases due to the existence of the railroad.
- (d) Identifying parcels which will no longer be economically viable for present uses, and developing alternative uses or appropriate compensation.
- (e) Implementing measures to limit or preclude nuisance impacts of the railroad.

With these goals in mind, the Applicant should undertake negotiations with individual landowners during acquisition of the ROW. By law, the Applicant will be required to negotiate in good faith with the individual landowners. Firm commitments as to the specific measures to be taken to attain the above-stated goals will be made and documented by the parties. Areas of concern that should be addressed include, but are not limited to, the following items.²

- (1) Direct and Indirect Land Loss. Each agricultural operation that is crossed by the Tongue River Railroad will experience some loss of agricultural land due to inclusion in the ROW. The mitigation for such loss is direct compensation. This compensation is properly negotiated on an individual basis between each landowner and the Applicant.

²These areas of concern have been identified through review of the comments on the Draft EIS and supplement thereto, review of testimony delivered at hearings, and consultation with NPRC staff members. NPRC's suggested mitigation recommendations were attached to its post-hearing brief as Appendix 4.

Indirect land loss, due to severance of parcels, will also occur in certain situations. The standards to be used in assessing that indirect loss will differ by landowner, and landowners will be given the opportunity to identify severed parcels in negotiations. It is possible to use some severed parcels for alternate agricultural purposes, thus mitigating to some extent the total loss. The Applicant should assist landowners in identifying and developing such uses where appropriate, and in applying a combination of such assistance and compensation, where necessary and agreed upon during ROW negotiations.

- (2) Displacement of Capital Improvements. Where capital improvements such as fences, wells, corrals, and irrigation systems are displaced, the Applicant should relocate or replace these improvements where possible. Generally, these capital improvements can be replaced. In some instances, it may be necessary to provide compensation for such displacements. Specifically, fences should be reconstructed according to the design specifications previously existing on the ranch or to specifications requested by the landowner and agreed to during negotiation. Where parcels have been redesigned, the Applicant should erect new fences to conform to the redesigned pasture parcel. Similarly, corrals, haysheds, etc., should be relocated within the redesigned land parcels.

Where wells and springs are displaced, the Applicant should replace the existing improvements to the current standard. For instance, every effort should be made to assure the continued use of natural springs. Often, this can be accomplished by the installation of culverts of proper design and location. In instances where a well is displaced, the Applicant should construct a new well and insure that there will be no additional cost to the rancher for the operation of that well beyond the cost incurred with the previous well.

Where irrigation systems, whether they be gravity or mechanical, are disrupted or displaced, the first goal of the Applicant should be to assist the landowner in redesigning the system in order to continue its current use. For instance, culverts should be installed and ditches reconstructed for gravity systems. For sprinkler systems and other mechanical devices, all attempts should be made to substitute a redesigned system. Where this is not possible, the Applicant should negotiate with the landowner for a combination of compensation and reuse of the parcel for some other purpose.

- (3) ROW Fencing. The Applicant should construct ROW fencing along the entire line according to specifications most

suitable to the landowners and consistent with industry standards. If special fencing needs or specifications are requested on individual ranches, it will become a matter for negotiation. Likewise, if, in some cases, landowners would prefer to forego fencing of the ROW in order to provide easier access for livestock across the rail line, the Applicant should consider such a request. It should be noted that such a request could be honored only after matters of safety and liability are considered.

- (4) Access Restrictions. The Applicant has tentatively identified 77 cattle passes that would be installed along the ROW. These cattle passes would consist of an oval, corrugated metal structure, roughly 12 ft. high and 11.5 ft. wide at the base. The proposed locations for these cattle passes were developed by the engineering consultants, using aerial photography, on-the-ground inspection, and information from individual landowners. The locations of these cattle passes were indicated in second phase engineering plan and profile sheets, which were provided to the individual landowners for comment. The Applicant should work with landowners during third phase engineering and ROW negotiations to identify the locations of any additional cattle passes and to finalize the placement of those previously identified. In addition, locations for grade crossings for equipment, etc., will also be determined through negotiations and engineering practicality.

In some cases, landowners may prefer a different type of cattle pass than that currently proposed by the Applicant, e.g., box culvert, trestle, etc. Recognizing that different types of cattle passes could be far more costly than those currently proposed, the Applicant should work with the individual landowners to develop an acceptable alternative. For instance, one alternative might be to install a trestle-type structure in lieu of two or three corrugated metal culverts. In such a case, the cost of the trestle could be basically the same as the culverts, and thus an acceptable compromise. In other instances, such as where the placement of a cattle pass is not feasible from an engineering standpoint due to an extensive cut, the Applicant should discuss with the landowner the possibility of a bridge over the railroad to provide access for cattle.

- (5) Impacts During Construction. During third phase engineering, the Applicant should work with individual landowners to avoid unnecessary conflict between construction-related activities and ranching operations, such as moving cattle between pastures during certain seasons of the year. However, it is recognized that inconvenience to the ranchers cannot totally

be avoided if a construction schedule is to be maintained. Temporary inconvenience to the rancher from construction-related activities should be considered during ROW negotiations.

All construction-related activities should be confined to the purchased or leased ROW, and to the construction camps located along the rail line. The specific location of construction camps should be solely a matter of negotiation between individual landowners and the Applicant.

Construction of the rail line will require bonding for Applicant's contractors. In the event of contractor-caused damage to a landowner's property, lengthy negotiations between the individual landowner and the contractor's bonding agent could ensue. In order to speed this process of negotiation, the Applicant should require its contractors to place sufficient funds in an escrow account to pay for incidental damages incurred during construction. Payment could be advanced from this fund, pending resolution of any liability on the part of the contractor for the damages incurred. Specifics of such a plan, including definitions of liability, would have to be negotiated between the parties, ICC, TRRC and affected landowners, prior to construction.

The Applicant should require its contractors to police construction camps during operation, to control the personnel in camps, and limit those personnel to workers directly involved in the project. Upon completion of construction, the camps should be reclaimed to their previously existing use.

The Applicant should appoint a railroad representative to work with the prime and subcontractors and the landowners to resolve any problems developing during construction. This individual should have direct access to the management of the Tongue River Railroad Company.

- (6) Impacts from Operation. Although every effort has been made to identify impacts from operation of the Tongue River Railroad, unanticipated problems could develop once the line has been constructed. In order to address these problems, the Applicant should appoint a representative to meet with landowners to discuss these problems after the railroad has become operational. The Applicant's representative should work with individual landowners to resolve any unforeseen problems that develop and to establish good landowner/railroad relations.

2.2 Impacts to Fort Keogh Livestock and Range Research Station (LARRS)

2.2.1 General

The potential impacts to LARRS have been explored in detail, both by the ICC's consultants and by LARRS personnel. LARRS personnel have taken an active role in development of the proposed route in coordination with the Applicant's engineers. In addition, LARRS personnel have examined the proposed route in detail and have developed a series of mitigation needs and procedures that were submitted to the Applicant. Those measures to which the Applicant has committed are included here. It is expected that these and other mitigation measures will be attached to a final easement agreement for ROW across the facility.

2.2.2 Specific Mitigation Concerns and Resolutions

- (1) LARRS has requested a grade-separated crossing for primary access to the southeast portion of the station. Access is currently obtained through a box-type culvert beneath U.S. Interstate 94. The alignment, as detailed in the proposed Branum Lake Option, calls for crossing under I-94. If this option is utilized, the Applicant will provide a non-blocked, grade-separated crossing from LARRS to insure adequate access to the southeast portion of the station. The Applicant is currently exploring the possibility of bridging over I-94 at this point. If this plan is feasible, then existing access would not be affected or altered by the railroad.
- (2) LARRS has requested that sufficient flood drainage be provided north of the Camel's Back. The Applicant will provide drainage with culverts designated to pass 100-year design floods.
- (3) LARRS has requested that a grade-separated crossing be located on the Burlington Northern Railroad (BN) ROW adjacent to the LARRS headquarters facilities. The Applicant has agreed to provide a grade-separated crossing at this location.
- (4) LARRS has requested two wells in the No. 3 pasture. One well is located in Section 13 and the other in Section 12. The Applicant has agreed to construct two new, non-electrified, wells or one non-electrified well and a pipeline, whichever is most appropriate.³

³LARRS staff have assumed responsibility for electrifying these and other wells, should they so desire.

- (5) LARRS has requested two railroad crossings in the No. 3 pasture. Underpasses would be desirable; however, crossings over the track would work. One is located from Section 13 to 18 and the other from Section 12 to 7. A road (all weather) from the Section 12 to 7 crossing along the track to Section 18 would also work. The Applicant has agreed to provide at least one separated grade crossing. The other crossing would be at grade.
- (6) LARRS has requested rip-rapping along the river in Section 6 in the 2C Bend pasture, if necessary. The Applicant plans to provide all necessary rip-rapping to insure the integrity of the railroad embankment.
- (7) LARRS has requested an underpass for cattle movement in Section 6. The Applicant has agreed to provide this underpass.
- (8) LARRS has requested a vehicle pass (18x14 ft.) in Section 36 near the existing road to allow access to Lower 2C Bend. The Applicant has agreed to a cattle underpass and an at-grade crossing for equipment at this location.
- (9) LARRS requests a track crossing for equipment where the track crosses Paddy Fay Creek. This concern should be resolved by Applicant's commitment to construct a bridge at Paddy Fay Creek.
- (10) LARRS requests an access road along the river from Section 23 (Lower Flood) to Section 25, 25 and 36 (2C Bend). The Applicant has agreed to provide a road parallel to the railroad ROW for access.
- (11) LARRS requests that the Applicant relocate the water tank and pipeline in Lower 2C Bend and locate a new tank in the north end of Lower 2C Bend. Applicant has agreed to relocate the existing water tank as well as to locate a new tank in the north end of Lower 2C Bend.

LARRS requests that the proposed alignment be located as close to the hill between Upper and Lower 2C Bend as possible to eliminate the waste land. The alignment submitted to the ICC in June 1983 incorporates this suggestion and is incorporated as the the Applicant's proposed action.
- (13) LARRS requests rip-rap along the river in the North Tongue River Bend. The Applicant has agreed to rip-rap along the river in the North Tongue River Bend, and has initiated 404 applications for this site with the U.S. Army Corps of Engineers.

- (14) LARRS requests that the TRRC relocate the well in North-South Tongue River fence line to water both pastures. The Applicant has agreed to relocate this well.
- (15) LARRS requests a vehicle underpass 18 ft. wide by 14 ft. high on the road from Lower Flood to North Tongue River Bend. After considerable discussion with LARRS, it was determined that a cattle pass under the tracks with an equipment crossing "at grade" with the tracks could be used in place of the 18 x 14 ft. underpass.
- (16) LARRS requests that the Applicant relocate the well between Lower Flood and Lower Flood Bend. (Pipeline system to serve Lower Flood, Lower Flood Bend, South Lower Flood Bend, and Middle Flood.) The Applicant has agreed to relocate the well between Lower Flood and Lower Flood Bend.
- (17) LARRS requests that the TRRC relocate the fence between Lower Flood and Lower Flood Bend pastures. The Applicant has agreed to relocate the fence.
- (18) LARRS requests that the Applicant place culverts under the track through Lower Flood to accommodate the flood dike system. Applicant has agreed to place culverts under the trackage through the Lower Flood area which will accommodate the flood dike system.
- (19) LARRS requests a road along the east side of Hill pasture, and a vehicle pass to North Tongue River pasture. The Applicant has agreed to these requests.
- (20) LARRS requests a vehicle pass by old Lone Pine road to access Lower Flood Bend. The Applicant has agreed to construct a vehicle pass adequate for pickups and cattle, with an at-grade crossing for larger equipment.

LARRS requests that, where the railroad meets and removes the all-weather road in Hill Pasture, provisions for new road be provided. The Applicant has agreed to replace this road.
- (22) LARRS requests that an underpass be provided where the railroad crosses the gravel road in Hill Pasture. The Applicant has agreed to provide a grade-separated crossing.
- (23) LARRS requests that a well be located in Hill Pasture to replace pit reservoir. The Applicant has agreed to provide a non-electrified well.
- (24) LARRS requests that the Applicant relocate the tank between Russian wildrye and Hill Pasture in Section 9. The Applicant has agreed to relocate the tank.

- (25) LARRS requests an 18x14 ft. vehicle underpass for access to highway tube and 3C Bend Pasture. The Applicant has agreed to provide a grade-separated crossing at this location.
- (26) LARRS requests that a well for 3C Bend and fish hatchery be provided. The Applicant has agreed to provide a non-electrified well at this location.
- (27) LARRS staff note that they may need a well relocated if the track is too close in the Nursery area. Should the proposed action be constructed, a relocation of the well would be provided by the Applicant. However, under the Branum Lake option, the Nursery will not be affected or disturbed.

Further discussion with LARRS personnel is expected, and it is likely that further detail and clarification will be required. This does not constitute a final easement agreement.

2.3 Impacts to the Miles City Fish Hatchery

The Supplement to the DEIS presents a discussion of potential impacts to the Miles City Fish Hatchery. Since the issuance of that document, the State of Montana has completed further studies related to future development of the hatchery and adjacent lands. Expansion of the hatchery would conflict with the proposed routing of the Tongue River Railroad. It should be noted that acquisition of ROW across State of Montana property requires a formal application process that affords adequate safeguards and mechanisms to assure that the hatchery, either in its present form or after expansion, will not be adversely affected.

The proper forum for detailed mitigation plans and commitments regarding the hatchery will be the State of Montana easement application process. The state is fully empowered to delineate the terms or conditions under which it will allow a railroad ROW across state property.

- (1) If the Branum Lake Option is built, it will require that the Fish Hatchery expansion plans be altered, either by moving a portion or all of the facility. In doing so, new plans will have to be prepared for the project. The Applicant should assist the Department of Fish Wildlife and Parks in the revised planning process, specifically as the new plans would focus on effects of the railroad on hatchery operations, e.g. noise, vibration, potential fuel leaks, etc.
- (2) The Applicant should continue to confer with the Department of Fish, Wildlife, and Parks in regard to expansion plans for the hatchery. Every effort should be made by both parties to inform the other as to continuing developments.

3.0 SOCIAL AND ECONOMIC IMPACT MITIGATION

3.1 General

The environmental documentation provides detailed information on those social and economic changes that are associated with development of the Tongue River Railroad. The projections contained in the documents cannot be expected to reflect perfectly every possible impact, but the data will serve to provide state and community planning agencies and personnel with the necessary information to meet the demands for increases in public facilities, personnel, and services.

The environmental documentation demonstrates how, in most cases, the increase in tax revenues accruing to local governments will more than offset increases in the costs of providing increased services and new or expanded public facilities. Local government planning agencies will be able to incorporate this information in their short term and long range planning efforts, thus assuring that proper planning and effective mitigation will be in place prior to the incurrence of impact.

In certain cases, local government and, thus, planning capabilities do not exist in any form capable of addressing the problems that could be presented by the construction and operation of a railroad and accompanying mining development. The community of Ashland, in particular, is not prepared to confront the changes and problems that will occur there. Of particular importance to Ashland will be population growth in the community and the corresponding increased demand for community services.

The Applicant should consult with the county and local governments for the purpose of assisting impacted communities in addressing the problems they face. Among the goals of such an effort would be to:

- (1) Assist the community of Ashland in developing a community organization representative of diverse opinion and point of view, for the purpose of addressing and dealing with railroad-related social and economic impacts.
- (2) Assist planning agencies and community groups in interpretation and understanding of the data developed in the environmental documentation. The ultimate goal of this task would be to make the information useful on an individual level for businesses and agencies. As the information is updated, for one reason or another, by state or federal agencies, the new information would be made available to these local groups.
- (3) Assist planning agencies and community groups in identifying those resources available to them to help deal with antici-

pated impacts, and as a follow-up, to assist these groups in taking advantage of those resources as appropriate. A prime example of such a resource would be monies generated by the Montana Coal Severance Tax, administered by the Montana Coal Board. Numerous other resources and avenues of dealing with problems exist, and the individual would provide guidance in identifying same.

To accomplish these goals, the TRRC will provide all practical assistance to those government planning agencies involved. Of primary importance will be making available the social and economic data generated in baseline studies. This should be quite useful if understood and practically applied by planning agencies.

4.0 TRANSPORTATION IMPACT MITIGATION

4.1 General

Impacts to local transportation systems and facilities that will occur as a result of the development of the proposed Tongue River Railroad can be divided into two general categories. The first category is impacts that will occur during construction of the rail line. The second category is impacts that will result from actual train traffic over the line. Much of the mitigation that will occur for the anticipated impacts will result from ROW negotiations between the Applicant and private landowners or governmental agencies. Some of these anticipated impacts are discussed in the Land Use section, already presented. Most important in terms of this discussion are those impacts that will directly affect public roadways and other existing affected public roadways and other existing transportation systems.

4.2 Construction Impacts

Construction-related impacts will generally involve either increases in vehicular traffic on local public roadways, with the attendant likelihood of greater inconvenience and increased likelihood of accidents, or direct disruption of normal traffic patterns due to construction activities across a road or highway.

The Applicant could mitigate the problem of increased vehicular traffic on local public roads and highways by implementing the following measures during construction activities:

- (1) During construction, contractors should be encouraged to provide transportation to the work site from some central location on a daily basis. This central location may be one of the work camps, a point near the northern terminus at Miles City, or some predesignated point elsewhere along the line,

selected to prevent an unnecessary traffic on public roads in the area. Details should be worked out with contractors based on final design criteria, specific tasks or phase of construction, numbers of personnel and equipment and work site.

- (2) To the greatest extent possible, all construction-related traffic, including worker transportation as well as equipment movement should be confined to the "pioneer road" that will be developed within the ROW. In instances where it is not practical to confine all traffic to this road, the Applicant or the individual contractors should make necessary arrangements with the appropriate landowners or agencies to gain access from private or public roadways which will minimize traffic impacts to the greatest extent possible. (The "pioneer" road would be used only during construction of the railroad grade and would be relaced by the grade prior to the placement of track).
- (3) All Applicant vehicles and equipment, and vehicles and equipment owned and operated by contractors working on the project, should strictly adhere to speed limits and other applicable laws and regulations when operating such vehicles and equipment on public roadways.
- (4) In cases where traffic along a public roadway may be disrupted during construction of the railroad, the Applicant should comply with all requirements of the Montana Department of Highways or other appropriate agency. In the absence of such requirements, the Applicant should endeavor to maintain at least one open lane of traffic at all times. Specific plans should be developed by the Applicant, and adhered to by contractors, to assure the quick passage of emergency vehicles. These plans should be coordinated through appropriate local agencies. All construction plans affecting public roadways will have to be submitted to the Montana Department of Highways for review and approval.
- (5) The Montana Department of Highways will provide various guidelines and stipulations for crossing such highways as Interstate 94 and U.S. 212. Maintaining normal traffic flows on these roadways throughout construction should be the principal goal of mitigation planning. When this is not possible, the Applicant should provide temporary detours and comply with mitigation measures required by state or local agencies.
- (6) In those instances where the disruption of normal traffic patterns or the temporary blockage of important roads or

highways is inevitable, the Applicant should work with the Montana Department of Highways or other appropriate agencies and the contractors to develop plans to time construction activities to coincide with periods of least impact. This may include such measures as working through the night time hours, or perhaps around the clock to speed construction in some locations.

- (7) All signing and work zone safety shall be in accordance with the Manual of Uniform Traffic Control Devices.

4.3 Operational Impacts

A significant impact from operation of trains along the new railroad line will be traffic delays at crossings which are not grade separated. Just as important, but less frequent, is the possibility of accidents involving trains and vehicles or pedestrians. To address that impact, the Applicant should undertake the following:

- (1) All grade crossings of the new rail line by public roadways should be equipped with warning signs and devices in compliance with current state and federal regulations, requirements and suggestions. To determine the appropriate warning devices for each new crossing, the policy for Railroad Crossing Protection of the Montana Department of Highways should be applied to each crossing, and the appropriate measures implemented.
- (2) A combination of Tongue River Railroad and BN traffic immediately downline from the connection at Miles City may require the elimination of certain at-grade crossings and their replacement with grade-separated structures. The Applicant should commit to working with the BN, the Montana Department of Highways, and the Town of Miles City to alleviate any traffic problems in the future. Data developed by the Applicant and the commission on the eventual problem at crossings in Miles City could be used as a starting point in these discussions.
- (3) The Applicant should adhere to all state and federal regulations regarding train operations. Such regulations provide for maximum durations of crossing blockage, speed limits within and outside of incorporated areas, candlepower for train lighting, etc.

It should be noted that the State of Montana ROW easement process discussed under 2.3 affords the opportunity to apply specific stipulations and requirements to the TRRC, thus safeguarding the public interest as regards traffic safety.

5.0 AIR QUALITY IMPACT MITIGATION

5.1 General

Impacts to air quality resulting from construction and operation of a new rail line will fall into two general categories. These categories include: (1) the introduction of air pollutants in the form of the products of combustion, generated by construction equipment and railroad engines; (2) the generation of increased quantities of fugitive dust into the air as a result of devegetation, earth moving, general equipment operation, wind; and (3) increased vehicular traffic on unpaved roadways. Simple techniques are available to mitigate these impacts. Since these techniques are universally applicable, and it is not necessary to delineate those that will be used only during construction. The Applicant should commit to the application of the following measures, either as company operational policy or as stipulations for contractors during construction:

- (1) All heavy equipment and vehicles used in the construction, operation, and maintenance of the railroad should be subjected to regular inspection and maintenance to ensure that operation is in compliance with manufacturer's specifications and that equipment is running as cleanly and efficiently as possible.
- (2) Strict speed limits should be established and adhered to on all access roads and within the ROW, to assure that fugitive dust emissions will be minimized.
- (3) The Applicant should recommend to the individual contractors that they provide group transportation (as discussed under transportation impacts) to minimize vehicular traffic on unpaved roads in the area.
- (4) When vegetation is removed from the ROW during the early stages of construction, the cleared areas should be kept to the minimum necessary. This will aide in the mitigation of the problems caused by wind erosion and vehicle borne fugitive dust.
- (5) In areas where devegetation has taken place, revegetation efforts should commence at the earliest possible opportunity. In those areas where immediate revegetation is not possible, alternative stabilization measures should be implemented. These measures could include matting, mulching, and even mulching with seed and fertilizer. (More details on revegetation are presented section 10.3 of this Master Mitigation Plan.)

- (6) Dust suppression at all work areas within the ROW and at work camps, staging areas, etc., should be accomplished with the use of water trucks. Arrangements for the acquisition of water should be made with either local landowners, agencies or associations. It is anticipated that such activities would occur regularly and frequently during the driest periods.
- (7) Any open burning required for the purpose of slash disposal or for any other reason during construction or operation of the rail line should be conducted in strict accordance with local regulations. All necessary permits should be obtained and all necessary safety precautions observed.

6.0 NOISE IMPACT MITIGATION

6.1 General

Noise impacts that are likely to occur as a result of construction and operation of a new railroad fall into two distinct categories. The first category is noise associated with construction activities, heavy equipment operation, a variety of vehicular traffic, etc. The second category is the noise that will result from trains operating along the new rail line. Several mitigation strategies listed here can be employed to mitigate construction noise impacts. It should be noted that the level to which construction noise impacts will occur to sensitive receptors is dependent upon route selection and final centerline location. More specific measures will be apparent at that time. Mitigation of noise impacts from train traffic is difficult, and is dependent to some degree upon volume of traffic as well as volume of downline traffic of all types on the BN mainline. As a result, most of the measures suggested here would require negotiations between the Applicant and the BN for any final implementation.

- (1) When feasible, all major noise-producing activities during construction should be scheduled to occur during the weekday and daylight hours.
- (2) In cases where such activities as the normal schoolday would be interrupted by noise interference, the Applicant should make every attempt to schedule the activities in a manner most acceptable to those impacted. This could include weekend or evening work in some cases. If this is not possible, consultation with school officials may result in workable solutions. This concern is specific to the Ashland area and St. Labre school.
- (3) The Applicant should require all contractors to use internal combustion equipment only if properly installed mufflers are

provided. Further, all equipment used for construction should comply with all applicable federal, state, and local noise regulations which reflect the current feasibility and practicality of equipment and activity noise reduction.

- (4) During operation, Tongue River Railroad trains will have to observe standard regulations regarding speed limits in incorporated areas to limit noise impacts. The Applicant should observe those same speed limits while trains are passing through the unincorporated community of Ashland due to the proximity of numerous dwellings.
- (5) The TRRC rail corridor extends through primarily rural and sparsely populated areas. Most of the dwellings in these areas are outside of the threshold for significant disturbance from noise. However, specific areas in Ashland and Miles City could experience interruptions from noise associated with TRRC trains. A noise monitoring program should be established at these locations to measure the noise levels as train traffic increases during later years of operation. This information would assist the TRRC and community officials in developing noise abatement strategies as they are needed.
- (6) In special cases, more direct noise abatement measures may be required. For example, the Applicant has agreed to provide a tree buffer between the Spotted Eagle Lake recreation area and the ROW. This buffer would serve the dual purpose of lessening the impact of noise upon those pursuing recreational activities and also moderating the visual impact to that area. Similar measures may be required on certain private holdings along the ROW. These would be identified during negotiations between the individual landowners and the Applicant.

7.0 SAFETY IMPACT MITIGATION

7.1 General

The heading Safety Impacts encompasses several broad areas of potential impacts. The first consideration under this heading is the prevention of construction-related accidents. A second consideration is the public safety as it relates to such occurrences as derailments, fuel spills, other toxic material spills, and other catastrophic events. A third general category includes the prevention and suppression of railroad-caused wildfire. Concerns regarding the potential for and response to train/vehicle and train/pedestrian crossing accidents are also topics considered here.

7.2 Construction Safety

Adherence to normal construction safety practices will minimize the potential for construction-related accidents. All contractors should hold safety meetings for their workers and assure that each person is cognizant of the safety measures and procedures expected in each work situation. Other actions which will enhance the overall safety situation include:

- (1) Contractors should be encouraged to provide group transportation to the job site, as discussed under that heading.
- (2) Speed limits for all construction vehicles and equipment, both on and out of the ROW, should be enforced.

7.3 Emergency Situations

A variety of events here classified as "emergency situations" could occur along the ROW, during either construction or operation of the railroad. These include such things as derailments, oil spills, and toxic substance spills. The Applicant should implement a number of general measures that can be used to initiate specific actions in response to emergency situations.

- (1) Planning Framework. The Applicant should develop an internal emergency response plan, which is consistent with Montana State plans authorized under Title 10, Montana Code Annotated (MCA), in an effort to avoid duplication. Such plans could include:
 - a. Emergency notification plan whereby a priority list of agencies and individuals to be notified in a specific emergency is prepared. The plan would include names and phone numbers of individuals to be contacted in case of such events as an herbicide spill, fuel spill, range fire, and medical emergency.
 - b. Procedures to be followed by railroad operation and maintenance personnel in case of such an event, including specific responsibilities by individual.
 - c. Directions for most timely response and fastest emergency vehicular access to any particular section of the rail line.
 - d. Locations and inventories of all emergency equipment, and any standard operational equipment which may be useful in dealing with emergencies.

(2) Cooperative Planning/Contacts. The Applicant should establish cooperative relationships with all local and state agencies that have responsibilities for disaster/emergency planning and response. The Applicant should provide operation plans and copies of the response plans noted in item (1) above to such agencies for review and suggestions. Comments from these organizations should be incorporated as necessary. These state and local agencies are to include, but are not limited to:

- a. Fire departments in Miles City, Broadus, Ashland, and other rural units along the route.
- b. Local ambulance and emergency medical services, as well as air evacuation services in Billings.
- c. Disaster and Emergency Services Division of the Department of Military Affairs, Helena. This is likely the most important contact in case of a major emergency in terms of developing a coordinated response.
- d. The Montana Department of Health and Environmental Sciences (especially the Water Quality Board).
- e. The Montana Department of Fish, Wildlife, and Parks.
- f. The Montana Department of State Lands, Land Administration Bureau.
- g. The Montana Department of Natural Resources and Conservation, Water Resources Bureau.
- h. U.S. Department of Agriculture, Fort Keogh Livestock and Range Research Station.
- i. U.S. Bureau of Land Management or U.S. Forest Service (recent reorganization proposals may transfer local segments of the Custer National Forest to the BLM for management).
- j. Other local agencies or groups which are identified as key to disaster.

(3) Fire Prevention and Suppression. The Applicant should develop a wildfire suppression and control plan for fires occurring on the ROW as a result of traffic or undetermined causes. The following considerations should be included in the plan.

- a. The plan should be developed after final engineering and overall operation plans are complete. This will afford planners the benefit of special information regarding exact location of centerline, access points, and equipment and personnel which might be of use in case such an event occurs.
- b. State-of-the-art techniques for fire prevention and suppression should be evaluated and included in the plan as applicable. Where an industry-wide standard exists, it should be adhered to or improved upon.
- c. During third phase engineering, the Applicant should attempt to provide the greatest possible access to all portions of the ROW, in terms of grade crossings and gates, in an effort to minimize response time. Certain areas adjacent to the ROW are more accessible than others. The Applicant should recognize topographic differences in providing access for emergency vehicles crossing the rail line. While there are no industry standards for determining the preferable distance between crossing points, it should be shorter in rougher terrain than it would be in more accessible areas. The Applicant should consult other railroads to ascertain the appropriate distance between access points.
- d. Since the Applicant will be a significant taxpaying entity, it can be assumed that the emergency assistance of the various tax-supported fire districts will be an integral part of this plan [see item (2) above]. It should be noted, however, that many rural fire districts operate on a strictly volunteer, unfunded basis. In such cases, the Applicant should develop relationships with these local organizations for the purpose of implementing funding agreements. A formula should be established, based on criteria applied by other railroads in the region, to determine the amount of funding per group.
- e. The Applicant should commit to all reasonable efforts to protect property, livestock, and the general public from damage due to Tongue River Railroad-caused fires. In addition, the Applicant should make every effort to assure adequate access to all areas on all sides of the ROW. All serious concerns and suggestions should be explored for practicality, usefulness, economic considerations, etc.
- f. The Applicant should observe all applicable operational regulations promulgated by the Federal Railroad Adminis-

tration. This will also serve to minimize the potential for railroad-caused fires.

(4) Oil Spill Prevention and Control Plan. The Applicant should develop, in concert with the appropriate agencies and private concerns, plans to prevent spills of oil or other petroleum products, both during construction and operation and maintenance. The plans developed should include those stipulations that would be imposed on firms involved in construction of the rail line. An aspect of such plans would be the emergency notification procedures, discussed in item (1) above. Other items that would be included are:

- a. Procedures for reporting spills.
- b. Definition of what constitutes a spill.
- c. Methods of containing, recovering, and cleaning up spilled oil.
- d. A list of needed equipment and locations of same.
- e. A list of all agencies and management personnel to be contacted, as in item (2) above.
- f. Assurances that techniques and procedures to be employed in cleanup are representative of the best technology currently available.

In addition to the items listed here, the stipulations to be followed during construction would be developed, in the form of guidelines based on the tasks to be accomplished by the individual contractors. Among the stipulations that could be employed are:

- a. Care during refueling to guard against overflows.
- b. Storage of fuel only in metal storage tanks surrounded by impervious dikes capable of containing greater than the capacity of the tank.
- c. Removal of waste oil to appropriate sites, away from the ROW.
- d. Keeping equipment in good running order and conducting routine maintenance activities at locations removed from the ROW.

Specifics of these plans should be discussed and refined with the appropriate agencies, and the plans should be in force at the start of construction.

- (5) Toxic Materials Spills. It is not anticipated that the Applicant will be involved with the transport of toxic materials. This consideration is included to account for the possibility that herbicides may be accidentally introduced to other than the designated portions of the ROW. (See vegetation discussion of noxious weed control.) The same general approach discussed under items (3) and (4) above should be taken, with immediate notification of the appropriate agencies and personnel being given priority equal to immediate containment. Procedures should comply with the law, regulatory guidelines, and the best technology currently available. Application of herbicides is a licensed activity and is done under strict supervision, and as such, response should be nearly instantaneous.

8.0 HYDROLOGY AND WATER QUALITY IMPACT MITIGATION

8.1 General

A wide variety of state and federal regulations and permit processes are in place to assure that overall water quantity and quality is not altered or diminished by activities such as the proposed Tongue River Railroad. Detailed permit applications are submitted to various agencies for the purpose of assuring that construction and operational activities on or near any waterways are conducted in such a manner as to provide minimal impact to those areas. Permit processes in which the Applicant is currently involved include:

- (1) U.S. Army Corps of Engineers "404" Permit process for all bridges and other structures occurring on designated streams (perennial). This process is required for each major bridge crossing of the Tongue River and Otter Creek as well as each area where rip-rap is to be installed. This process requires detailed environmental data as well as construction data. Permits are issued with accompanying stipulations to limit environmental impact to the greatest degree possible.
- (2) The "310" Permit process, jointly administered by the local Conservation Districts and the Water Quality Bureau of the Montana Department of Health and Environmental Sciences. This process is very similar to the "404" process previously discussed. Similar procedures for attaching stipulations to a permit also are followed.
- (3) Temporary Discharge or "Turbidity Exemption" permits are being sought from the Water Quality Bureau of the Montana Department of Health and Environmental Sciences. These permits are required wherever construction activities may cross any stream bed or bank (ephemeral or perennial). As a

result, each crossing of a stream bed, dry or not, requires such a permit.

- (4) Since the State of Montana holds title to the stream bed of the Tongue River, the bridge crossing will require additional authorization under the easement application process. The regulatory authority of the state, administered by the Department of State Lands, will further safeguard the public interest and the affected resource.

In addition to these very detailed permit processes, a number of other safeguards can be built into the final design of the rail line. Some of these include:

- (1) All culverts and other drainage structures installed at ephemeral and perennial stream crossings will be designed to pass the projected 100-year flood.
- (2) Where possible, the proposed route is designed to avoid the flood plain. Where the railroad grade does infringe upon the flood plain, drainage structures should be installed to assure that the grade does not restrict or re-route the 100-year flood.
- (3) To prevent unnecessary degradation of water quality due to erosion, revegetation efforts should begin as soon as possible after construction is complete in a given area. (See revegetation section, 10.3.)
- (4) Spills of fuel or other toxic or hazardous substances which may affect water quality should be addressed in the manner described in the section on safety.
- (5) Construction of all stream crossings, including bridges and culverts and such activities as require stream bank encroachments (rip-rap, for example), should be timed to occur during periods of low or no flow in the streams affected. The vast majority of stream beds traversed by the railroad are dry most of the year, so such scheduling should not be difficult.

It also should be noted that a study has been conducted to determine the extent to which the Tongue River Railroad would constrict the flood waters from a disaster such as a breach of the Tongue River Dam. The study shows that the railroad grade would, to some extent, alter the inundation pattern, but would not lead to any increase in damages to humans, livestock or property. Further, it would not appreciably affect the disaster plans as discussed in the Tongue River Dam Emergency Warning and Evacuation Plan, published by the Montana Department of Natural Resources and Conservation.

9.0 AQUATIC ECOLOGY IMPACT MITIGATION

9.1 General

Impacts to aquatic resources from the proposed Tongue River Railroad are likely to occur only in those areas where the railroad grade directly infringes upon the stream bank or stream bed. Such places include river crossings requiring bridge construction and areas where rip-rap is required for stream bank stabilization. In coordination with state agencies, primarily the Department of Fish, Wildlife, and Parks (MFWP), the Applicant should proceed with detailed, site-specific inventory work of potential impact sites, upon the completion of third phase engineering. Based upon the results of the work, specific mitigative measures can be determined and applied. The biologist conducting the work would be subject to the approval of MFWP personnel.

- (1) Aquatic Resource Sampling. For those locations where the proposed Tongue River Railroad would cross the Tongue River, or where extensive rip-rapping would occur, a three-part plan of study should be undertaken to identify aquatic resources. The results of the study would be utilized in the development of mitigation plans. The three-part plan of study includes: (a) a stream habitat survey to identify existing habitat features and values; (b) benthic macroinvertebrate sampling to identify community composition and numbers; and (c) fish spawning survey to determine the importance of the area to spawning of game fish.

- a. Stream Habitat Survey. The stream habitat survey should utilize methods described in "Methods for Evaluating Stream, Riparian, and Biotic Conditions."⁴ Stream transects would be established in appropriate locations to evaluate existing conditions and to monitor changes during construction. Along each transect, the following variables would be measured:

1. stream width
2. stream shore depth
3. stream average depth
4. pool (ft.)
 - (a) quality

⁴William S. Platts, Walter F. Megahan, and G. Wayne Minshall, "Methods for Evaluating Stream, Riparian, and Biotic Conditions," General Technical Report Int-138, Intermountain Forest Range and Research Experiment Station, Ogden, Utah.

- (b) forming feature
- 5. riffle (ft.)
- 6. run (ft.)
- 7. substrate
 - (a) boulder (greater than 12 inches)
 - (b) cobble (12-2.5 inches)
 - (c) coarse gravel (2.4-.5 inches)
 - (d) fine gravel (.14-.1 inches)
 - (e) sand
 - (f) clay
- 8. stream bank soil alteration rating
- 9. stream vegetative stability rating
- 10. stream bank undercut and angle
- 11. vegetation overhang
- 12. embeddedness

b. Benthic Macroinvertebrates. Quantitative samples of benthic macroinvertebrates should be collected immediately upstream and downstream of each proposed location of disturbance. The collected specimens should then be counted and identified at least to genus and to species where possible. The composition of the community should be described.

c. Fish Spawning Survey. Several species of game fish spawn in the Tongue River, including sauger, walleye, channel catfish, smallmouth bass, and sturgeon. A game fish spawning potential survey should be conducted at each proposed bridge location as well as areas of proposed extensive riprapping. Sampling periods for the spawning survey would be early spring after ice breakup, after peak runoff, and in the fall. Collection methods would include electro-shock, seining, trap netting, and fry sampling.

(2) Mitigation Techniques. Once sampling has been completed and detailed data on the aquatic resource to be affected have been obtained, mitigative measures can be delineated. Some of the measures that could become necessary include:

- a. Preparation of a construction schedule which provides for instream work at those times least critical to the specific fishery or aquatic resource occurring at a site, as well as the period least conducive to sediment transport. Such periods differ by stream and species affected.
- b. Developing special procedures for handling of displaced materials and petroleum products to prevent introduction

of such materials into the aquatic system. The procedures referred to here would be dictated by site-specific geographic and construction criteria.

- c. Running silty water through settling pond systems when dewatering for footing construction is required.
- d. Assuring that backfill at crossing and rip-rap sites is washed and essentially silt-free.
- e. Double-shifting at crossing sites to minimize the duration of construction activities in or near stream banks.

It should be further noted that all sampling activities have been suggested by and would be coordinated with the Montana Department of Fish, Wildlife, and Parks. It is likely that MFWP personnel will be responsible for any electrofishing aspects of the inventory.

10.0 TERRESTRIAL ECOLOGY IMPACT MITIGATION

10.1 General

Two areas of concern are addressed under the overall heading of terrestrial ecology -- wildlife and vegetation. The thrust of the terrestrial mitigation plan will be to provide additional information and options for avoiding unnecessary impacts to vegetation and wildlife. All individuals conducting further wildlife or vegetation studies will be qualified individuals, as is the policy of the ICC. If necessary, these individuals will be approved by the MFWP.

It should also be noted that the State of Montana has expressed an interest in the possibility of some form of compensation for habitat loss due to ROW construction. Through the Department of Fish, Wildlife and Parks, the State of Montana has suggested five additional areas that could be considered by the TRRC as part of final ROW negotiations with individual landowners. These are:

- (1) The participation by the TRRC in the development of a "compensation" program for lost wildlife habitat along the rail line. Compensation could include the purchase by the TRRC of "cut-off" land parcels containing good wildlife habitat, and the donation of these lands to the Department of Fish, Wildlife and Parks for beneficial wildlife management.
- (2) The construction of wildlife-related ponds adjacent to, or using the railroad grade as a dam. These could include "dugout" type ponds, and "bypass" ponds designed to be filled during high flows.

- (3) The providing of public access, in appropriate locations, along the rail line ROW.
- (4) The granting of conservation easements by the TRRC along the rail line.
- (5) Fencing that would not restrict the movement of big game animals wishing to cross the railroad ROW.

Implementation of any of these measures would have to await ROW negotiations with affected landowners. Therefore, it is not possible or desirable to suggest adoption of any of the specific measures listed at this time. It should be noted that the State of Montana's regulatory authority over easements across state lands would provide a vehicle for addressing the DFWP's concerns.

The TRRC should work with the Montana Department of Fish, Wildlife and Parks to evaluate the feasibility of these actions. Some measures, such as conservation easements, public access, etc. might conflict with adjacent landowner wishes. Implementation of these measures, therefore, would have to be reasonable, practicable, and take into account the concerns of all parties.

10.2 Wildlife

The kinds and amounts of habitats that will be lost during construction of the Tongue River Railroad were identified in the environmental documentation. Avoidance by wildlife of normal use areas adjoining the construction site is considered to be a short term impact that will be mitigated by the completion of construction; wildlife will simply reoccupy those areas where their normal use patterns have been disrupted. Mitigation of other impacts, however, requires identification of those sites where impacts may occur. Once sites are identified, numerous mitigation techniques can be developed and applied to deal with specific cases. The following methods can be used to identify those sites:

- (1) An updated aerial survey should be conducted during the winter before construction begins. An aerial survey may identify new winter ranges, as well as locate any new prairie dog colonies along the route.
- (2) A thorough ground reconnaissance should be conducted between April 15th and May 15th. During this period, grouse leks will be active, raptors will be nesting, and winter ranges may still be identifiable. The entire ROW should be covered, preferably by walking. In some areas it will be possible to cover the ROW by vehicle, but much of the route will be accessible only on foot.

- (3) The purpose of reconnaissance will be to locate big game winter range based on evidence, such as animal remains, hair, pellet groups, etc.; locate any prairie dog colonies that were not recorded during the aerial survey; locate sage grouse and sharp-tailed grouse leks; and locate raptor nests, particularly golden eagles and prairie falcons. Evidence of threatened or endangered species, such as black-footed ferrets and peregrine falcons, would also be sought during the reconnaissance.
- (4) Any specific use sites that are located during the reconnaissance should be mapped, described in field notes, and photographed. Nesting raptors should not be disturbed, but nests should be described as active or inactive.
- (5) Sage and sharp-tailed grouse leks should be located by listening for displaying males at dawn. Lek locations should be mapped. If possible, a count of the displaying males should be made. If lek sites are discovered later in the day after displaying has ceased and/or birds have left the site, the site should be revisited the following morning or as soon as possible.
- (6) Prairie dog colonies that are intersected by the ROW should be mapped to their approximate size on 1:24,000 USGS topographic maps. Following the field reconnaissance, the size of these colonies should be planimeted and a rough estimate of the existing population should then be made by comparison with results reported in the literature.
- (7) Prairie dog colonies also should be searched for evidence of black-footed ferrets, following the methods outlined in "Handbook of Methods for Locating Black-footed Ferrets."⁵ Ferret presence is most easily detected in late summer and during winter (December 1-April 15). The search along the Tongue River Railroad ROW should occur during the winter period, when evidence is most easily discerned.

Colonies affected by the right-of-way should be searched at least once and preferably three times. All colonies should be surveyed on foot, by walking transects spaced approximately 50 m apart back and forth across the colony. Any evi-

⁵T.W. Clark, T.M. Campbell III, M.H. Schroeder, and L. Richardson, "Handbook of Methods for Locating Black-footed Ferrets," U.S. Bureau of Land Management, Wildlife Technical Bulletin No. 1 (1983), Cheyenne, Wyoming.

dence of ferrets, such as digging, tracks, scats, skulls, etc., should be photographed and, where appropriate, collected. Scats and skulls should be identified following the keys in the "Handbook." If ferret evidence is found, the proper authorities should be notified following procedures of the Endangered Species Act.

- (8) Similarly, although it is highly unlikely that nesting peregrine falcons will be found along the ROW, any occurrence of nesting activity should be properly recorded and reported.

10.2.1 Mitigative Measures

The TRRC should commit to implementing all reasonable and practical measures that result from studies conducted during third phase engineering. These may include some of the following measures:

- (1) Construction Timing. The primary method of impact mitigation for wildlife is timing construction activities. All reasonable attempts should be made to avoid construction at big game wintering sites from December through March.
- (2) Fawning Sites. Timing of construction may be less effective in mitigating disturbance at "fawning sites," because this term cannot be consistently applied to a given geographic location. That is, a site where deer or antelope fawns are born in one year may not be used in the following year.

Most fawns are born during the period May 15 - June 30. Late in the reconnaissance period, any single female deer or antelope that are observed should be assumed to be at or near a potential fawning site. The locations of these individuals should be mapped. On an individual basis, it may be possible for construction activities to avoid these sites during the fawning period. However, if construction cannot be delayed, the resulting impact (displacement of pregnant females to another location) should not significantly affect these species.

- (3) Black-footed Ferrets. If black-footed ferrets or their evidence are found in any affected prairie dog colony, appropriate regulatory authorities should be consulted. It will probably be necessary to examine these sites on several occasions to determine whether or not ferrets are currently present in the colony. If a ferret population is present, the proper authorities should be consulted to determine the probable long term impact to ferrets if construction proceeds through the colony. Since ferrets are primarily nocturnal and may not be particularly disturbed by human presence, it

may be possible to time construction activities during the day when ferrets are least active.

- (4) Raptors. It is highly unlikely that eyries of the endangered peregrine falcon or bald eagle will be encountered along the ROW. If such nests are found, the appropriate authorities should be contacted. Any active golden eagle or prairie falcon eyries located during the reconnaissance should be mapped. If the ROW passes adjacent to such eyries, construction in the affected area should be timed to avoid the critical incubation and early rearing period (April 1-June 30).

10.3 Vegetation

Vegetation concerns related to the Tongue River Railroad are primarily divided into two categories, reclamation and noxious weed control. Reclamation of devegetated areas is important for a variety of reasons, including the prevention of erosion, limitation of air pollution by fugitive dust, contribution to the stability of the railroad grade, and the importance of providing wildlife habitat. Noxious weed control is an area of great concern to local agricultural operations and should be a priority of Applicant operation and maintenance personnel.

- (1) Reclamation. Reclamation or revegetation of the ROW should commence at the earliest possible time after clearing has been completed. In most cases, such revegetation cannot begin until construction is complete. But, wherever possible, it should be expedited. The following are general concerns and practices that should be employed in the process:

- a. Preconstruction Planning. Successful reclamation begins with thorough preconstruction planning. Elements of such planning should contain the following:

1. Designation of sensitive areas.
2. Proposed time schedule of construction activities.
3. ROW clearing and site preparation plans.
4. Erosion and sediment control plans.
5. Waste disposal plan.
6. Restoration, reclamation, and revegetation plan.

- b. Restoration/Reclamation Plan. Elements of an adequate restoration and reclamation plan include:

1. Starting reclamation immediately after construction ends, with the goal of rapidly re-establishing

ground cover on disturbed soils, with all cut and fill slopes mulched and seeded as they are completed.

2. Avoiding reclamation when soil moisture is high or ground frozen.
3. Analyzing site soil requirements and seasonal precipitation patterns to identify planting dates for optimal revegetation success.
4. Use of rapidly establishing plant species for thorough and rapid ground surface protection.
5. Providing a reclamation specialist to determine specific procedures for areas with reclamation problems such as on steep slopes or locations near waterways.

c. Revegetation Success Assurances. To ensure revegetation success, the following measures should be taken:

1. Determination of type and quantity of seed, kind of fertilizer, and other soil amendments based on soil chemical and physical properties should be made, with emphasis on native species where possible.
2. Topsoil should be segregated from subsoil and stockpiled for later application on the reclaimed ROW.
3. Only seed of registered quality and germination success should be utilized.
4. Appropriate seeding techniques should be used, such as drill seeding on level terrain and broadcast or hydroseeding on slopes to ensure distribution of seed mixture on individual microenvironments.
5. The Applicant should use mulch material, such as straw and woodchips, as a temporary erosion measure and to minimize soil temperature fluctuations and soil moisture loss. Mulch should be applied more heavily on slopes than on level terrain and nitrogen levels adjusted to reflect the increased demand during mulch decomposition.
6. The seeded area should be covered and compacted following seeding.

7. A minimum of 20 lbs./acre of pure live seed should be used throughout the route.
8. For slopes and construction areas near waterways, a variety of methods including sediment raps, berms, slope drains, toeslope ditches, diversion channels, sodding, and mulching should be used.
9. Reclamation should be monitored, and regrading eroded surfaces and revegetating areas not successfully reclaimed should be undertaken.

d. Provisions for Areas of Special Concern

1. Stream Crossings. Banks should be stabilized with naturally occurring trees, shrubs, and grass. Rip-rap or gabions should be used only as a supplement or where such methods would improve fish habitat, or in cases where engineering requirements so dictate.
 2. Construction Sites. All litter, debris, and soils associated with petroleum spills should be removed prior to reclamation. An approved landfill may be used.
 3. Slopes Greater Than 3:1. On cut and fill slopes steeper than 3:1 but less than 2:1, serrations should be made parallel to the slope to act as stable seed beds and sediment traps. Mulching and seeding should be conducted using hydroseeding/mulching equipment. Every attempt should be made to minimize foot traffic on the reclaimed slopes until vegetation is well established.
- (2) Noxious Weed Control. The first step in the control of noxious weeds is reclamation of disturbed land along the railroad construction corridor before use by the railroad. This will limit bare soil required for optimal weed colonization. Following establishment of revegetation species and coincident with the beginning of rail transport, a noxious weed control program should be implemented. This program is intended to control all Montana's designated noxious weeds. It is not intended to control invader grass species.

The program should consist of a spray program using 2-4D at one pound per acre beginning June 1st and at monthly intervals until late September. This formulation should be used

on all areas of the ROW except near waterways, where Weedar 64 (a nontoxic form of 2-4D amine) should be substituted. The spray sequence has been chosen to ensure that weed plants do not reach maturity and therefore seed dispersal before being irradiated by the herbicide. All precautions normally used around herbicides should be followed and it is recommended that 2-4D amine, rather than 2-4D ester, be used because of its lower volatility. Records of application dates should be kept and referenced to ensure that program goals are fulfilled.

All activities should be conducted according to applicable regulations and guidelines, and should be coordinated with local weed control districts. In all cases, only trained, licensed, personnel should be involved in applications. Coordination with local ranchers would be an acceptable element of the overall plan, at the request of those individuals.

The Applicant should work with the local weed control districts to establish schedules for herbicide applications. In establishing the schedule, a provision should be made that, if the Applicant does not apply the measures by an agreed date, the weed control district would have the authority to implement the appropriate measures and to be reimbursed by the Applicant for those efforts.

- (3) Threatened and Endangered Plant Species. As of 1984, a document prepared by the Montana Rare Plant Project and titled Vascular Plants of Limited Distribution in Montana contains listings of plants that are currently or likely to become legally protected.⁶ As a result of this effort, species that might occur in southeastern Montana have been identified. During the course of other activities, biologists will be aware of potential habitats for the species listed in the document cited. If examples of any such species are encountered, appropriate actions will be determined through consultation with governmental authorities.

⁶P. Lesica, G. Moore, K.M. Peterson, and J.H. Rumely, "Vascular Plants of Limited Distribution in Montana," Monograph No. 2, Montana Academy of Sciences, Supplement to the Proceedings 43(1984):11-12, 18, 21.

11.0 CULTURAL RESOURCES IMPACT MITIGATION

11.1 General

Construction of the Tongue River Railroad will have an effect upon cultural resources (historic, prehistoric archeological, and architectural) that may be on or eligible for nomination to the National Register of Historic Places (NRHP). After selecting and surveying an alignment, but prior to the initiation of third phase engineering, a Memorandum of Agreement (MOA) should be developed in consultation with appropriate authorities.

The (MOA) would detail: (1) the survey boundaries and methods to be followed in conducting an intensive pedestrian survey of the alignment; and (2) the steps and plans to be followed in treating cultural resources that are determined to be eligible for listing on the NRHP and that may be adversely impacted by the construction and operation of the railroad. The (MOA) should take into account, but not be restricted by, the guidelines set forth in Section 106 and 110f of the National Historic Preservation Act (16 U.S.C. 470) and its implementing regulations, "Protection of Historic and Cultural Properties" (36 C.F.R. 800).

During the preparation of the environmental documentation for the proposed railroad, a number of cultural resources were tentatively identified. A preliminary determination of eligibility was made for each site. The pedestrian survey conducted according to the terms of the SIIAP would provide the TRRC with more complete information about the presence of cultural resources in the study area. Utilizing the SIIAP, the Applicant should provide the following information regarding cultural resources:

- (1) Identification. The pedestrian survey should accurately locate all historic, prehistoric, and architectural sites located within the ROW and buffer area. In addition to locating all cultural resources, Applicant should photograph each site, prepare site maps and written descriptions, and document the development of each site, based on records research and oral interviews.
- (2) Evaluation. Each cultural resource site should be assessed using the criteria for evaluation (36 C.F.R. 60.6) to determine whether the site meets the eligibility requirements for listing on the NRHP.
- (3) Impact Assessment. Based on the above evaluations, the Applicant, in consultation with appropriate authorities, should determine whether eligible cultural resource sites will be impacted, directly or indirectly, by construction and/or operation of the railroad.

- (4) Mitigation. The SILAP should contain a detailed procedure that should be followed if an eligible cultural resource site will be adversely impacted by the construction and/or operation of the railroad. The mitigation measures should include but not be limited to those set forth in the ACHP's "Manual of Mitigation Measures (MOMM)."⁷

The Applicant should prepare a cultural resource technical report that will detail the results of the field survey. The report should contain information on all sites identified, an evaluation of each site, and a recommendation for further work on all eligible sites that may be impacted during construction and/or operation of the railroad. The report also should contain recommendations for mitigating impacts to each site.

12.0 SUMMARY

The successful mitigation of impacts associated with the Tongue River Railroad will require cooperation and coordination among a wide variety of individuals, state and federal agencies, and local governments. A complex body of regulations applies to most aspects of construction and operation of such a project. In order to comply with the regulatory requirements imposed upon the Applicant, it may become necessary to adjust non-regulated aspects of the suggested mitigation procedures. It is safe to assume that certain conflicting mitigation concerns will occur. In such cases, it is important that lines of communication be maintained between all parties.

A number of tasks remain to be accomplished in terms of development of the Final Mitigation Plan. Most of these tasks are presently constrained by the permitting process itself, but will be accomplished once a decision to proceed is made. These tasks include, but are not limited to:

- (1) Individual ROW negotiations with landowners, to include site-specific mitigation provisions.
- (2) Easement negotiations with the U.S. Department of Agriculture for the ROW through LARRS, to include detailed mitigation stipulations.
- (3) Easement negotiations with the Montana Department of State Lands, the Montana Department of Fish, Wildlife, and Parks,

⁷Department of the Interior, National Park Service, Advisory Council on Historic Preservation, "Manual of Mitigation Measures (MOMM)," October 12, 1982.

and the U.S. Bureau of Land Management for ROW across lands under the control of those agencies. It is assumed that numerous site-specific mitigation stipulations will be included in resulting agreements.

- (4) Development of a detailed construction traffic control plan.
- (5) Development of construction mitigation stipulations to be required of all contractors providing services to the Applicant.
- (6) Conduct field studies of impacted aquatic habitat.
- (7) Conduct field wildlife surveys.
- (8) Develop site-specific revegetation and weed control plans.
- (9) Develop cultural resources management plans.

Where the specific requirements of these various planning instruments come into conflict, certain priorities must be established to resolve differences. In all cases, regulatory requirements should take precedence over matters of convenience, either to the Applicant or to other parties. In cases where the public health or welfare is at issue, such concerns should take precedence over matters of economic, spatial, or temporal convenience.

APPENDIX 42



Ken Blodgett
Surface Transportation Board
395 E Street SW
Washington, D.C. 20423-0001

Attention: Environmental Filing, Docket No. FD 30186

December 5, 2012

Dear Mr. Blodgett:

On behalf of Northern Plains Resource Council (Northern Plains) members, I am submitting the following scoping comments to the Surface Transportation Board (STB) in response to its October 22, 2012, Notice of Intent (NOI) to prepare an environmental impact statement (EIS) on the application to build the Tongue River Railroad (TRR) in Montana. This application was submitted by the Tongue River Railroad Company (TRRC) on October 16, 2012. These comments are submitted in an effort to aid the STB in identifying issues that we believe should be addressed in the EIS. While we have made a good-faith effort to identify issues we believe are relevant to the proposal as presented, we know that the STB has directed the TRRC to file additional information in a revised application that is due December 17, 2012. We reserve the right to provide additional comments on that application and, if necessary, in the future as this project continues to evolve. Please ensure that our comments are entered into the public record.

Northern Plains is a grassroots conservation and family agriculture non-profit organization based in Billings, Montana. Northern Plains organizes Montana citizens to protect our water quality,

family farms and ranches, and unique quality of life. Northern Plains is dedicated to providing the information and tools necessary to give citizens an effective voice in decisions that affect their lives.

Northern Plains formed in 1972 over the issue of coal strip mining and its impacts on private surface owners who own the land over federal and state mineral reserves as well as the environmental and social impacts of mining and transporting coal. Many of our members own farms and ranches along the various alternative routes proposed by the TRRC in its application for this railroad as well as in the area along Otter Creek that is slated for coal development to supply that railroad. Our members' livelihoods depend entirely on clean air and water, native soils and vegetation, and lands that remain intact. The proposed TRR would bisect and disrupt not only individual ranches but an entire rural, agricultural valley that has existed sustainably for more than 100 years. Many more of our members live along and near railroad lines that will be the subsequent conduits for the millions of tons of coal proposed for shipment by the TRR to the coal's final destination.

Northern Plains has opposed the building of this railroad since it was first proposed in the 1980s. We have argued for years that the environmental analysis in the first and subsequent EISs was scant, flawed, and useless for making an informed decision. Eventually, and after much time and great expense to our members and our organization, the Ninth Circuit Court of Appeals has agreed with us and directed that the STB start over and **do it right**. For that we are grateful.

Through these many long years, however, the TRRC has persisted in its speculative schemes, searching for a reason to be built (e.g., TRR II, TRR III, and now this proposal). The repeated threats of eminent domain and the intimidation that the TRRC has used against our member landowners all these years will not be forgotten. The fact that this project has been "hanging over the heads" of our member landowners and others for years has resulted in lessened property values and in landowners being unduly concerned about whether or not to make certain improvements to their properties. This railroad has always been a speculator's dream, but even so, it has harmed many.

Through these many years we have learned much, and our expectations about what should be included in this EIS and the thoroughness of the analysis used to evaluate the environmental consequences of this project will be uncompromising. We expect that the EIS prepared for this project will provide the agency decision maker with all the information necessary to ensure that there is a **real and valid purpose and need for the TRR; that viable alternatives, including the no-action alternative, have been thoroughly examined; and that the benefits of the action outweigh the many environmental consequences.**

Purpose and Need

The TRRC in its October 16 application assumed that the original permit it received in 1986 for the TRR is still fully in place. Our reading of the STB's November 1, 2012, decision requesting additional supplemental information from the TRRC states otherwise. Specifically, "We make clear here that we reopened the TRR I proceeding to review in full what is now the entire TRR I

line construction project. The Board's review will include . . . an examination of the transportation merits supporting the entire TRR I line."

We believe that a determination of the "transportation merits" of the TRR – whether or not this railroad serves a "public convenience and necessity" – cannot be fully ascertained until after the environmental analysis of the impacts of the project and the accompanying public process are completed. Consequently, **we urge the STB to make the determination on the TRR's "public convenience and necessity" after the EIS process is complete.**

The purpose of this railroad has changed multiple times through the years and with this application it has changed again. Frankly, in our opinion, the TRR should now be re-christened the **Coal-to-China Railroad**. There is one purpose for this railroad and one purpose only – to haul Otter Creek coal to West Coast ports for shipment to China. We are aware of no other coal mine proposals in either Rosebud or Powder River counties beyond the proposed (and yet-to-be-permitted) Otter Creek Mine. What other coal mines are envisioned by the TRRC – in the foreseeable future – for supplying their railroad with a reason to be built? It seems there is none by TRRC's own admission on page 20 of their application (“ . . . at present, there are no known mine projects other than the Otter Creek mine in that area.”). Based on statements from Arch Coal (detailed below) and the fact that use of coal in U.S. power plants has declined (and continues to decline) significantly (details below), we believe that the TRRC must detail in their application exactly where the coal they are hauling is headed and include the impacts to Montana and the Pacific Northwest related to coal export.

In the October 16, 2012, application that the TRRC filed with the STB, the description of the proposal states on page 2: "The rail line approved in 1986 splits into two branches just south of Ashland, MT and has two Terminus Points – (1) Terminus Point #1 continues southwest and terminates at the previously proposed Montco Mine location ("Montco Mine Spur"). . . ." Later (on page 5), the application states: "TRRC no longer seeks to construct the rail line from Terminus Point 1 to Decker, Montana authorized in the 1996 TRRC II Decision and the 2007 TRR III Decision." Why, then, is the branch line south of Ashland, Montana, to Terminus Point #1 – the Montco Mine location – included in this application and the STB's NOI?

In 1984, the Montana Department of State Lands (DSL) issued the Montco Mine a surface mine permit, but, the mine was never built. By 1994, because no work had begun, the DSL denied Montco another renewal to its mining permit. This denial resulted in court challenges with Northern Plains, Native Action, and the Northern Cheyenne Tribe participating as interveners on the side of the State to deny the permit renewal. The case was eventually decided in the State's and intervener's favor by the Montana Supreme Court in October 1997. The result is that the Montco Mine has no permit to mine coal. So, again, what is the purpose of this branch line?

By TRRC's own admission on pages 20/21 of their application, the land traversed by the rail line is used primarily for livestock grazing and to raise dry-land crops. "It is not known at this time whether other industries will locate in the area served by the TRRC's line, but *TRRC will hold itself out as a common carrier to transport for any shipper upon reasonable request.*" [emphasis added] This is a bet "on-the-come" and based on nothing, in our opinion. The TRR is not a

"common carrier" and should not receive a permit to build a private, single-purpose railroad that will have significant and devastating consequences for the Tongue River valley and its residents.

Proposed Action and Alternative Routes

This NOI also states (on page 4) that "[the STB's] Office of Environmental Analysis (OEA) is interested in scoping comments on potential alternatives to TRRC's proposed alignment, including at a minimum, those analyzed in the EIS in TRR I." No detailed maps or description of these alternatives were provided.

Because Northern Plains and many of our members are "parties of record" to this docket, we received an additional notice that did include a very general overview map and written description of the proposed route and alternatives (Moon Creek, Colstrip, and Tongue River Road alternatives). Most – but not all – landowners along the proposed route are likely "parties of record." But, landowners along the alternative routes are most likely not "parties of record" so they have no idea that this new TRRC application includes alternatives that might impact them. This is unfair and wrong. When coupled with the break neck speed with which the STB announced the scoping, held hearings, and established a deadline for comments, it gives the appearance that the process is purposely truncated, which denies potentially impacted landowners the ability to study the alternative routes and evaluate the impacts a specific route could have on them.

The TRRC application includes a confusing written description of the proposed project (pulling wording from various past applications/EISs and pasting them together here), a general overview map (from Miles City to the Ashland/Otter Creek mine area), and aerial photos from the 1980s/1990s. These aerial photos are often incorrect as some properties have changed ownership. The application also refers the reader to previous documents (e.g., TRR III, the Radian Report), which most people do not have or have a way to access.

Our members and others who own land along the proposed route and alternative routes need to understand exactly where this railroad might be located so that they can adequately understand and address any impacts and concerns should the route be located across their land. The public must be afforded accurate, current information on the proposed route and alternative routes if we are going to have the opportunity to comment effectively on this project.

Under the National Environmental Policy Act (NEPA) and the Council of Environmental Quality (CEQ) regulations implementing NEPA, agencies must fully consider the “no-action” alternative. Project approval is not – and should not be – automatic. We believe there are many reasons that the environmental and social and economic consequences of this proposed action should not be approved. **We hope – we expect – that the no-action alternative will be fully considered, analyzed, and evaluated during this EIS process.**

We appreciate the STB's November 1, 2012, decision requesting additional supplemental information from the TRRC; however, we believe that that information is necessary to adequately scope the issues and concerns that need to be included in the EIS being prepared by

the STB. **We strongly urge the STB to leave the scoping period open until all the pertinent information, including that on routes and alternatives, is supplied by the TRRC and available to the public.** We also believe that additional public scoping meetings will be necessary at that time to address any new proposals or significant information.

Finally, we are incredulous that the TRRC has not proposed an additional alternative. Even if the company insists on their original proposed route that goes toward Miles City (and the company does not want to consider the Moon Creek alternative for whatever reason), why would there not be an alternative route that curves west as the railroad approaches Miles City and crosses Interstate-94 west of the Miles City Fish Hatchery? Such a route would avoid the incredibly negative consequences to the hatchery that a rail line poses as well as avoid the impacts and environmental consequences of nearly certain increases/ exacerbations to the Miles City flooding issues (as well as other impacts to the community) [see comments below for specific concerns]? The coal from Otter Creek is destined for Asia. Why is the route of the TRR headed east into Miles City only to turn west to the coast?

Issues That Must be Thoroughly Analyzed and Evaluated in the EIS

The following issues are presented in the order outlined in the NOI, and this order does not necessarily represent a level of priority for Northern Plains' members. Each issue comment is important in its own right to the preparation of a complete and thorough EIS document that provides the agency decision maker with all the information necessary to make an informed decision.

The purpose of the NEPA EIS requirement is to ensure that available data is gathered and analyzed prior to implementation of the proposed action. It is critical that current, scientifically valid baseline data be gathered in order to accurately judge the merits of this proposed action. If necessary, this may mean that the STB must negotiate with private property landowners to gain access to their property to gather data for the EIS. Requirements of the EIS process also mean the STB will use this data to analyze and disclose the degree of impacts to resources, not just merely state the obvious (that is, for example, to simply provide a list of wildlife species found in the area instead of analyzing population status, habitat needs, and possible reasons for any decline in numbers).

Finally, for each category that the STB describes in this NOI, an item termed "mitigative measures" is listed. This NOI states (on page 4) that following the scoping period on this draft scope of study, a Final Scope of Study will be issued for the preparation of a draft EIS for this project. That Final Scope of Study "will also contain OEA's preliminary recommendations for environmental mitigation measures."

We respectfully remind the STB that in the Ninth Circuit Court of Appeals December 29, 2011, decision on the suit brought by Northern Plains against the STB concerning TRR II and TRR III, the Court admonished the STB that ". . . mitigation measures, while necessary, are not alone sufficient to meet the Board's NEPA obligations to determine the projected extent of the environmental harm to enumerated resources *before* [emphasis added by the Court] a project is approved. Mitigation measures may help alleviate impact *after* [emphasis added by the Court]

construction, but do not help to evaluate and understand the impact before construction. *In a way, reliance on mitigation measures pre-supposes approval* [emphasis added by Northern Plains]." We strongly urge the STB to take the Court's admonition to heart in its preparation of this EIS.

1) Transportation Systems

As stated above, our members and others who own land along the current proposed and alternative routes need to understand exactly where this railroad would be located so that they can adequately understand and address any impacts and concerns should the TRR route be located across their land. In particular, landowners crossed by alternative routes need to be notified as soon as possible that they might be crossed. The public must be afforded the opportunity to have copies of accurate, current maps of the proposed route and alternatives if we are going to be able to effectively comment on the proposed rail line and alternative routes.

Currently, unit coal trains are 120-125 cars (or 1¼ miles) in length. The application states that the TRR will be designed to accommodate coal trains that are 150 cars in length. Proposed sidings are, thus, approximately 1⅔ miles long. The application and the NOI are vague concerning details of where these structures will be built, stating only that they will be "near" MP 27 and MP 46. Please ensure that accurate detailed information on the siding locations is disclosed and thoroughly discussed in the EIS.

The locations of the set-out tracks, which could each be nearly a mile in length, are not disclosed. The set-out tracks are for "temporary" storage of cars needing repair as well for as storing and clearing of maintenance equipment. What other structures/facilities will be located along with the set-out tracks? How long could cars or equipment located here be parked and stationary? Essentially, what does "temporary" mean (e.g., for many months, even years, rail cars were stored along a track adjacent to the Missouri River between Helena and Great Falls; this "temporary" storage not only was a major problem for landowners but was even more problematic for wildlife whose ability to access water was severely hindered by the long-stationary cars)?

The Tongue River Road (S-332) is the north-south, all-weather-gravel county road that parallels the Tongue River between approximately Ashland and Miles City. In the past year, a corridor study was initiated to analyze potential improvement options, cost estimates, and possible funding options for upgrading the road. How does the placement of the TRR route impact this study and the road? Will the TRR necessitate movement of the road or any infrastructure improvements? Will the TRRC participate in cost-sharing any of the costs for improving S-332 especially if the railroad requires re-routing or other infrastructure changes? **We believe that the improvement of this road is a connected and cumulative impact of the TRR.** How would these two projects be co-planned and/or co-managed to lessen impacts to residents and users of the road during the construction phase for either or both projects?

The EIS needs to address the issue of crossing Interstate-94 and the issues that are involved with this major and important east-west throughway serving eastern Montana.

How will the TRR cross U.S. Highway 212 at Ashland? This is a major trucking route. How many trucks and other vehicles travel this road each day? The idea of a crossing with flashing lights and guard arms at the bottom of the hill entering Ashland is cause for significant concern. Will the TRR be required to build an overpass for either the road or the railroad? This issue should be thoroughly examined in the EIS.

We discuss the issue of coal export in detail later in our comments; however, we wish to raise here the fact that the increased coal train traffic that is proposed by the TRR will contribute to this connected, cumulative, and extremely significant related issue facing Montana and the Northwest. Increased coal train traffic from the TRR will contribute to the impacts along the entire existing rail transportation network in Montana and the Northwest. While the TRR might argue that they will "only" be adding approximately 26 round trips per week to the current rail traffic, that rail traffic will potentially increase if coal export becomes a reality, and the additional traffic from the TRR contributes to this significant connected and cumulative issue.

In July 2012, the Western Organization of Resource Councils (WORC) released a report, *Heavy Traffic Ahead: The Impacts Associated with the Expected Increase in Railroad Export Coal Movements from Powder River Basin Origins to Existing and Proposed Pacific Northwest Export Coal Terminals*, prepared for WORC by rail transportation consultants Terry Whiteside and Gerald Fauth, III, and transportation attorney Richard Streeter [see <http://www.heavytrafficahead.org/>]. Among the many conclusions in the report, some that are most pertinent to the issue of "Transportation Systems" include:

- The west-bound movement of coal is likely to disrupt the frequency and reliability of inbound and outbound shipments of containerized traffic and that traffic would likely experience diversion to California and Canadian ports.
- Export grain railroad traffic would be adversely impacted by the reduction of rail capacity and would likely experience deterioration of rail service, such as higher transit and cycle times, and would likely incur higher costs in the form of higher freight rates and equipment costs.
- Many areas along the routes would require major upgrading and expansion of existing tracks and related infrastructure, which could cost billions of dollars.
- While this coal export commerce would generate billions of dollars in annual revenues for railroad, coal, and port terminal companies, state and local governments would bear the brunt and burden of most of the related infrastructure costs in their localities and would likely be required to spend hundreds of millions of dollars in related mitigation, litigation, debt, and other costs associated with the necessary improvements to accommodate export coal traffic levels.

2) Safety

The TRR must develop a detailed emergency response plan for derailments. That document should be included in the EIS so that affected landowners and area residents can have the opportunity to comment on those plans. The plan should clearly explain how the TRR would

respond to any spillage of hazardous materials such as fuel. The plan should detail how a coal spill into a waterway would be responded to and addressed.

If soil contamination occurs because of the operation of the TRR or because of an accident, where will TRR haul the contaminated soil? What sort of a bond must TRR post to ensure that any environmental, health, life, and safety issues are properly dealt with because of a derailment?

What safety measures are required for rural crossings? If an accident occurs, what are TRR's obligations/ responsibilities? Are landowners who are crossed by the railroad liable for accidents in the TRR right-of-way, even through no fault of their own?

What will be the impacts of increased train traffic through Miles City on local traffic as well as safety at railroad crossings?

Will TRR fence the entire right-of-way? If not, will TRR be required to compensate ranchers for any cattle or other livestock injury or death should that animal be hit on the tracks? If livestock obtain access to the tracks and cause a derailment, what liability would a rancher incur?

The Tongue River Valley is a semi-arid area that experiences many fires (both man-caused and natural). The fires of 2012 were catastrophic. Railroads are notorious for starting fires. Will TRR be required to prepare a fire suppression plan? How will it be implemented? Who will pay if the railroad starts a fire? The railroad's location could present an impediment to quickly accessing an

area during a fire. What is the liability of the TRR if its trains start a fire and/or impede emergency responders?

3) Land Use

The TRR will industrialize an agricultural area that currently enjoys clear air, clean water, native grasslands, valuable fish and wildlife habitat, quiet communities, and abundant recreational opportunities. Together, the proposed railroad and the coal mine it is dependent on for a reason to exist would fundamentally change the character of the environment and the quality of life enjoyed by Northern Plains' members and other residents of this area. The area will be permanently and negatively affected by the TRR and its connected and cumulative activities.

Currently the Tongue River valley is filled with ranches that have been operational for generations. It is a quiet, low-population, rural agricultural region. The EIS must include baseline data on the number of acres and locations of prime farmland in relation to the proposed railroad as well as baseline information on the productivity of these prime farmlands and the importance of such irrigated lands to the farms and ranches of the valley. What are the numbers of prime farmland and rangeland that will be lost to the TRR? How will the TRR compensate landowners for the severed portions of farm- or rangeland if no longer usable?

If the railroad crosses a ranch, portions of the property, including agricultural fields, irrigated pastures, winter pastures, calving pastures, and other important ranch areas, could be severed. How will this be addressed? Some of these ranch areas are not replaceable elsewhere because of

specific requirements or reasons for their current location (e.g., calving areas located near ranch homes for easier access during this multi-day, 24-hour cycle, irrigated pastures near water sources).

Additionally, the value of the entire ranch will be diminished should the railroad bisect any portion of the ranch. Today, should a rancher want to sell his property, potential buyers often include those who are looking for recreational opportunities (e.g., for hunting); a railroad decreases such values. How will the landowner be fairly compensated by the railroad?

We also insist that the TRRC engage in open, honest, and fair negotiations with individual landowners and all efforts be made to avoid use of eminent domain for condemnation of private property.

Should the railroad cross a rancher's land, the following concerns are real, valid, and must be addressed:

- How will cattle and other livestock be kept off the railroad right-of-way? Will the railroad install and maintain fencing?
- If cattle and other livestock are cut off from access to water by the railroad, be it from a free-flowing stream or river, a spring or seep, or a man-made structure or impoundment (including stock water pipelines), will the TRR be required to either replace the water or provide safe passage from one side of the tracks to the other for those animals?

- While cattle can, under the right conditions, be encouraged (or forced) to move through a culvert under a rail line (assuming there is no train coming), what obligations will the railroad have to keep those culverts free from drifted snow?
- Will the TRR be required to install bridges instead of culverts, which would allow for better cattle passage (as well as better wildlife passage)? This should be examined in the EIS.
- If the railroad is located across a rancher's irrigated pasture or production land, will the railroad be required to pay for the costs to re-route the irrigation equipment?
- Weeds – the issue is explained in detail below in "Biological Resources," but suffice to say here, this is a critically important concern for Montanans along the proposed route (and/or alternative routes) and must be adequately addressed in the EIS and by the TRR.
- Fires – as explained above, fires are endemic to the area, but increased fires because of the railroad will further burden ranchers, government employees, and public safety employees. What sort of a fire management plan will TRR be required to complete and when will the public have the opportunity to comment on it? We believe that this should be part of the EIS process. Will the TRR be required to deposit an adequate bond for fire fighting and fire control?
- During construction, how will the railroad control dust? We have heard reports of "dust pneumonia" that livestock experienced in northern Wyoming during the construction of a railroad between Gillette and Orin Junction. There are also reports that grazing areas there became so covered with dust that some cattle refused to eat. Will the railroad be liable for these impacts?

- How will the railroad control livestock during construction? If fences are taken down and livestock wander away, will the TRR be responsible for returning the livestock and/or will the TRR be liable if an animal is injured or killed?
- Where will access roads for railroad maintenance be located? Will the TRR maintain these access roads and control for trespass?

As explained above (in "Transportation Systems"), there is a corridor study underway to analyze potential improvement options, cost estimates, and possible funding options for upgrading the Tongue River Road (S-332). What coordination will the TRR have with this project and will TRR participate in cost-sharing any of the costs for improving S-332?

4) Recreation

The Tongue River area is an important and popular big game and bird hunting area. How will the railroad impact hunting? Please compare hunting information for this currently relatively pristine area with other areas in the West following construction of a railroad. Many landowners in the area participate in the Block Management Program managed by the Montana Fish, Wildlife and Parks (FWP) Department. Will the railroad or the landowner (either private or state owner) be responsible if a hunter (with permission to hunt on the specific land) is injured on the railroad right-of-way/easement?

The TRR proposed route crosses the Tongue River Ranch, which was acquired by the State of Montana in 2007 and is managed as part of the state trust lands for our K-12 schools. The

Montana Department of Natural Resources and Conservation (DNRC), Montana FWP, and Pheasants Forever joined together to purchase this property that is opened to all for recreational access and hunting. This publicly accessible ranch provides access to other public lands that were previously inaccessible. A railroad crossing this ranch presents numerous problems and, not only will essentially undisturbed habitat set aside for recreation be disturbed now by a railroad, but recreational users of the ranch will now be presented with physical barriers as well as liability concerns because of the railroad right-of-way.

Please clarify if the TRR route includes either a passing siding or set-out tracks on the Tongue River Ranch. These additional industrialization structures are totally inappropriate on state land set aside for recreation.

Properties abutting the Tongue River Ranch have established conservation easements for wildlife and non-development purposes. The TRR will degrade if not impinge on these easements. The railroad route should not be permitted to cross property set aside (with public money) for public recreational/hunting use.

The Spotted Eagle Park in Miles City would be significantly impacted by the TRR, both because of the safety issues involved with the railroad tracks near the park and with the increased likelihood of flooding due to the track placement (see below for further discussion of flooding issues). Please ensure that the EIS addresses this issue in detail.

5) Biological Resources

Comprehensive, current, on-the-ground baseline surveys and studies for all biological resources must be prepared for this EIS. As has been seen in the past EISs prepared for the TRR, without adequate studies, meaningful evaluations of the potential environmental consequences of the TRR cannot be made. A few, but by all means not all, points to consider are highlighted below.

The EIS will need to include baseline vegetative surveys and habitat maps. Are there any threatened and endangered species, species of special concern (regionally, nationally, or globally), or endemic species in the project area? How will native vegetation be protected or, if disturbed, restored/reclaimed? Vegetative surveys should map and detail the species found in wetland and riparian areas. Will the TRR be required to avoid these areas? If not, what process will be used for "replacement" of disturbed wetlands?

Construction of any kind, but especially large-scale transportation route construction, is notorious for spreading weeds. The Tongue River Valley is relatively free of noxious, exotic weeds. As part of the baseline vegetative surveys, a survey and detailed map of all weed infestations now found in any of the proposed or alternative route areas should be completed. How will the railroad prevent the introduction of noxious weeds, and, if those weeds appear, control them. Will sterilization of construction materials and steam-washing and inspection of equipment be required? During the operation of the TRR, how will weeds be controlled that could be traveling on the returning rail cars? If weeds are introduced into the area, will the TRRC be required to pay for their elimination/control? Will the ranchers whose property is crossed by a

right-of-way corridor have any say in how these weeds are controlled? Who is responsible for controlling a weed infestation if the weeds are introduced via the railroad and escape the right-of-way? Will the TRRC be required to post an adequate bond for the control of weeds? As most weed control involves toxic chemicals, how will the TRRC ensure that the river and other waterways, riparian areas, and wetlands are protected?

The EIS will need to include baseline data for any terrestrial wildlife species, including threatened and endangered species and species of special concern, in the project area. This includes game (e.g., mule deer, white-tail deer, antelope, and elk) and non-game mammal species, birds, amphibians, and reptiles. These studies should include estimates of current population numbers, population trends (and causes for those trends), habitat requirements of each species and habitat conditions, as well as identification of critical wildlife habitat (e.g., winter range, calving ranges, nesting sites). Distribution maps should be provided where possible. How will construction activities and operation of the railroad impact species (e.g., what is the impact to species from the increase and constancy of noise)?

How will the railroad impact game migration corridors? Will game overpasses be considered (wildlife rarely will use culverts)? How will the railroad address normal wildlife passage along its route, especially in relation to wildlife accessing water? How will the railroad be fenced and will that fence accommodate wildlife passage (e.g., antelope do not jump fences but must be able to crawl under or through fencing)? Will the railroad route be adjusted if important or critical wildlife habitat is identified? What is the estimated numbers of wildlife that will be killed by the railroad? How will the railroad adjust its operation to avoid wildlife kill?

Prairie bird species (both game birds and non-game resident and migratory species) are an important ecological component of the short-grass prairie. Many of these species are struggling due to declines in this once wide-spread habitat. The TRR will impact these species by industrializing a rural area that is nearly intact ecologically.

Raptors such as burrowing owls, short-eared owls, golden eagles, ferruginous hawks, and merlins are known to inhabit the area. Burrowing owls are of particular interest because of the rapid decline in their numbers and because they appear to be totally dependent on mammal burrows with prairie dog towns providing prime habitat. Ferruginous hawks and merlins have suffered population declines in this region. The EIS must address the added stress and impacts that will result from the construction and operation of the TRR.

What neo-tropical migratory species inhabit the area; which species breed here and which simply pass through? What are the regional trends for these species and is any habitat in the Tongue River Valley considered critical for their survival? It is known that songbird species richness and breeding bird densities are highest in riparian woodlands and wetland habitats. How will the TRR impact these areas? Bald eagles, a threatened species, are known to inhabit the Tongue River area. Nest areas must be identified and avoided.

The sagebrush steppe is one of the most severely threatened bird habitats in the Intermountain West. Brewer's sparrow, sage sparrow, sage thrasher, and sage grouse are particularly vulnerable as sagebrush declines, which is happening due to destruction, disturbance, and

introduction of non-native species. The greater sage grouse, a candidate for listing on the threatened and endangered species list, are viewed as an indicator species for the sagebrush community.

The greater sage grouse has seen a drastic decline in its population numbers (from 16 million 100 years ago to about 200,000 today) and is known to have resident populations in the area proposed for development by TRR. While Montana appears to have healthy populations of sage grouse today, the species has been in dramatic decline elsewhere in the West due to habitat loss and fragmentation as well as the impacts of energy development. Sage grouse leks are known to be located on some of the properties along the proposed TRR route and alternative routes, including the Tongue River Ranch. Research on sage grouse has shown that disturbances within 1 mile of an active lek have adverse impacts on the sage grouse population. Sage grouse are most sensitive during breeding and nesting seasons (1 March – 15 June); however, there is evidence that disturbance during winter and of winter habitat are also critical to sage grouse viability and survival. The EIS must detail how the TRR impact this imperiled species and those environmental consequences must be fully considered.

The EIS will need to include baseline data for any aquatic species (both fish and invertebrates), including threatened and endangered species and species of concern, in the project area. These studies should include estimates of current population numbers, population trends, habitat requirements, habitat conditions, and identification of critical aquatic habitat (e.g., spawning and rearing sites) for each species.

The Tongue River is a unique and nearly pristine prairie-river ecosystem. Such a warm-water, prairie stream provides essential habitat and is one of the last remnants of a once widespread Great Plains riverine community of fish and invertebrates. The macroinvertebrate communities in these remaining rivers are as rare and special as the fishery. Various species were probably quite common generally in prairie rivers in the northern Great Plains in the past but have been declining and even eliminated throughout most of their historic range due to impoundments and other river alterations. Consequently, any impacts to this river system caused by the construction and operation of the TRR will be especially significant. The EIS must fully consider this issue.

Additionally, the Tongue River is important in its role for recruitment of fish in the lower Yellowstone River, and this must be protected. Small creeks and intermittent streams and ephemeral channels are also extremely important in this prairie ecosystem. A significant body of research in the Great Plains indicates that not only do intermittent streams support fish (they can be an important nursery area for juvenile fish), but they also play an important role in the biodiversity of the region.

The Miles City Fish Hatchery maintains a breeding stock of the endangered pallid sturgeon. As critically imperiled, the proper maintenance of this hatchery stock is essential to preventing the species' extinction. Why would the TRR be allowed to cross the Miles City Fish Hatchery when there are alternative routes available to the railroad? The vibration studies supposedly conducted years ago are flawed and not valid. State and federal biologists as well as the U.S. Army Corps of Engineers rejected the studies and stated they believed that the vibrations from the railroad through the hatchery would have significant impact on this imperiled species. The railroad

should not be allowed to cross the Fish Hatchery property. As noted above, there are realistic alternative routes possible, and the TRRC should be told to examine them, and the EIS must fully evaluate this issue.

6) Water Resources

Water is a precious resource in this semi-arid region of the state. Ranchers and other residents who live along the Tongue River rely on surface waters for irrigation and agricultural production. Shallow aquifers provide water for domestic and livestock use. Those who live farther from the river rely principally on groundwater wells for their water. Currently there are many maintenance-free springs and seeps that are used by both wildlife and livestock. If the TRR, either through construction or operation, disrupts or destroys any of these critical water sources, how will the TRR replace the water?

Again, when the railroad cuts off the access to water for cattle and other livestock – be it from a free-flowing stream or river, a spring or seep, or a man-made structure or impoundment, including stock water pipelines – will the TRR be required to either replace the water or provide safe passage from one side of the tracks to the other for those animals?

A 2009 paper published in the scientific journal *Geomorphology* by Paul Blanton and W. Andrew Marcus, titled "Railroads, roads and lateral disconnection in the river landscapes of the continental United States," discusses the ecological and functional impacts to river landscapes when transportation infrastructure is imposed on mid-sized alluvial valleys in rugged terrain. It

specifically discusses the long-term issue of cut-and-fill alluviation and the short-term issues of the flood and flow-pulse processes. How will the TRR integrate these findings into their plans? The EIS needs to fully evaluate these issues.

The STB must use the most up-to-date information to identify and discuss the status of the Tongue River and its tributaries for the entire length of the railroad. The EIS must discuss the magnitude and sources of any impairment to the river today, and discuss how such impairments could be worsened by the construction of the railroad.

The sedimentation to the river system that will result from the construction activity necessary to build the TRR proposed route, especially the cut-and-fill sections in drainages and the bridging necessary, has the potential to significantly harm the river and the aquatic life therein. All of the new infrastructure imposed in and next to the Tongue River will forever change flow regimes, introduce sediments, and will negatively affect the long-term health of the river. The EIS must fully detail how the TRR intends to avoid these impacts.

The EIS must clearly detail that the TRR will need certification from the State of Montana for the construction and operation of the TRR and ensure that those activities will not violate Montana water quality standards as required by Section 401 of the Clean Water Act.

Furthermore, the Montana Water Quality Act requires that new non-point sources of pollution implement “reasonable soil, land, and water conservation practices.” These practices must include “methods, measures, or practices that protect present and reasonably anticipated beneficial uses.”

Many of Montana's numeric and narrative water quality standards are directly applicable to the construction and operations of the railroad including narrative standards that prohibit changes in water quality that will adversely impact aquatic life and other beneficial uses. The EIS must discuss the status of the TMDL [total maximum daily load] process for the Tongue River and detail the restrictions that bind the TRR to compliance with that process. (See below for further discussion of cumulative water quality issues.)

Where will the railroad get the water it will need for construction purposes? Water is a precious resource in this area and is already over-allocated.

7) Navigation

Miles City is partially located in a floodplain (as well as partially located in the 100-year floodplain) and has experienced significant flooding in the past. While the NOI states that the U.S. Army Corps of Engineers has been invited to be a cooperator with the STB on this project, we believe that the Federal Emergency Management Agency (FEMA) must conduct a flood analysis of the impacts that construction of the proposed TRR route would create for Miles City.

Ice buildup in winter during low flows on the lower Tongue River and at its juncture with the Yellowstone River and the resultant flooding back along the Tongue as well as into Miles City can be a significant problem in some winters. The TRR route could exacerbate this problem; the EIS must fully examine this issue.

As part of the cumulative impact of coal export that is a connected issue to the construction of the TRR (detailed below), navigation issues in Puget Sound and along the West Coast need to be addressed in the EIS as part of that cumulative issue.

8) Geology and Soils

The general morphology of the area is either river valley or steep-sloped, highly erodible bluffs. Soils along the entire route must be mapped for soil type and slope stability. Estimates for loss of soil from erosion related to construction or operation of the TRR as well as for the cut-and-fills proposed must be calculated. See "Water Resources" for additional concerns about sedimentation. What is the earthquake-hazard potential in this region?

Based on the geology and soils information, what is the potential for full reclamation of the land disturbed by the railroad right-of-way following construction? Will the TRR be required to deposit an adequate bond to ensure that reclamation activities are successful?

Does the TRR route cross any alluvial valley floors (AVF), defined by the State of Montana as "the unconsolidated stream-laid deposits holding streams where water availability is sufficient for sub-irrigation or flood irrigation agricultural activities"? If so, will the route or construction activities be modified to preserve this important resource? As a cumulative impact, the STB is obligated to consider whether or not the Otter Creek Mine will impact an AVF.

9) Air Quality

What is the ambient air quality of the area and what are the sources of impairment today? The EIS must detail how this project and the connected and cumulative projects described in these comments will affect the Class I air quality of the Northern Cheyenne Reservation.

In this dry and windy environment, construction activities that denude the soil will eventually lead to blowing dust, dirt, and debris. Please detail the potential changes to air quality from construction activities.

Railroad engines emit diesel fumes and coal dust can blow off the coal being hauled. What will be the affect on the ambient air quality of this area from the emissions resulting from the operation of the TRR? Will the TRR be required to cover the coal cars to reduce the amount of dust blowing off the coal? If not, how will coal dust be mitigated?

10) Noise and Vibration

We often don't think of noise as a health issue beyond the obvious link of loud noise exposure to hearing impairment and deafness, but the medical literature does link noise to significant human health issues. Noise is linked to cardiovascular disease, including increased blood pressure, arrhythmia, stroke, and ischemic heart disease. Noise is linked to cognitive impairment in children. Noise is linked to sleep disturbance and resultant fatigue, hypertension, arrhythmia, and

increased rate of accidents and injuries. Noise can exacerbate mental health disorders such as depression, stress and anxiety, and psychosis.

The noise that the operation of the TRR will have in a currently rural, non-industrialized, agricultural valley is a significant impact. The noise from the additional train traffic through Miles City is also an impact that must be considered. The added noise of train traffic along the cumulative coal export route is an impact that must be considered.

Federal law requires train engines to blow their horn when approaching a crossing whether that crossing has guard arms that come down or not. There is a process that communities can go through to establish "Quiet Zones." But, the citizens of the community wanting the Quiet Zone generally pay for the infrastructure upgrades required to allow trains to not blow their horns – and it can cost millions. Will the TRR be required to help pay for these costs?

As noted above, the Miles City Fish Hatchery maintains a breeding stock of the endangered pallid sturgeon. As critically endangered, the proper maintenance of this hatchery stock is essential to preventing the species' extinction. The vibration studies supposedly conducted years ago are flawed and not valid. State and federal biologists as well as the U.S. Army Corps of Engineers rejected the studies and stated they believed that the vibrations from the railroad through the hatchery would have significant impact on this imperiled species. If the TRRC persists in retaining this route for consideration in the draft EIS, the STB must ensure that current, comprehensive, and scientifically valid vibration studies are done.

The EIS should also evaluate the effects of vibration on structures such as bridges, retaining walls, homes, ranch structures, pipelines, irrigation systems, stream banks bluff cliffs that lie near the rail tracks. In particular, the areas with underlying clay soils will be potentially most impacted by vibrations. The EIS needs to identify these areas and ensure that the TRR avoids them or ensures that the structures are reinforced. We believe that a sufficient bond must be imposed on the TRR to ensure that future issues are properly dealt with and resolved.

11) Energy

The EIS must address the capacity and impact to the rural electric co-operative that supplies electricity to this region. Will all existing and anticipated electrical needs be met when the needs of the TRR, which requires electricity for its signal and communication infrastructures, are added to the grid? Is there enough power to supply the connected and cumulative Otter Creek Mine if it is permitted and built?

12) Socioeconomics

While we do not disagree with the idea that the TRR will provide numerous temporary construction jobs and possibly some new railroad jobs, the impacts to the communities and the region from the influx of those new workers must be detailed. Eastern Montana and North Dakota communities are reeling under the oil-and-gas boom economy. The lives of local residents have been up-ended by this dramatic change to their communities.

Tax revenues are insufficient for the counties and communities to cover the increased costs of law enforcement, emergency services, schools, infrastructure maintenance, social services, and other government services (to name just a few). Communities often are faced with aging infrastructure, including water treatment and sewage treatment facilities, which could be overwhelmed by the increased use presented by these temporary workers. The EIS must clearly and fully address these issues.

The EIS must fully disclose and analyze the issue of man camps. Will there be such camps or, if not, where will the construction workers be housed? If there are man camps, where will they be located, how large will they be, how will they be supplied with water, how will their sewage be dealt with? What will be the security/policing arrangements for such camps?

How will the workers be transported to the work sites each day? Will there be a busing plan to reduce accidents and impacts to the roadways? What steps will the TRRC take to prevent trespass from construction workers onto private property? What requirements or regulations will the TRRC impose on these temporary workers?

13) Cultural and Historic Resources

In 2011, the STB attempted to revise the existing Programmatic Agreement (PA) for the TRR project as it was soon to expire. The many affected tribes that the STB brought together for this discussion were incensed by the proposed revision of the PA as none believed they had been consulted during the original TRR I NEPA process. They also believed the PA was woefully

deficient and that many things had changed during the past 25 years (e.g., the Battle of Wolf Mountain site and the Rosebud Battle site had both been designated National Historic Landmark sites). The tribes called for conducting complete ethnographic and archeological studies (including on-the-ground Class 1 surveys) and insisted that there be honest consultations with their Nations before they would sign any PA.

We agree with the tribes that the STB must conduct full and complete ethnographic and archeological surveys along the route, the alternative routes, and in the general area that will be impacted by the TRR project. These impacts will be direct when in the path of construction and indirect due to the changes this project will bring to the ancestral homelands of these Native Americans. We also want to see a complete historic resources survey completed.

14) Aesthetics

The TRR will industrialize an agricultural area that currently enjoys clear air, clean water, native grasslands, valuable fish and wildlife habitat, quiet communities, and abundant recreational opportunities. The area will be permanently and negatively affected by the TRR and its connected and cumulative activities. Increased traffic, increased noise, increased dust . . . the list goes on (see comments above) and the end result is a quiet, peaceful, rural agricultural valley will be turned into an industrial zone. The EIS must address these values and issues.

15) Environmental Justice

Isolated ranch families, low-income residents of Ashland, many Northern Cheyenne tribal members, and the Amish community will all be disproportionately impacted by the construction and operation of the TRR. The EIS should discuss the impacts on these communities that the TRR will create.

Finally, an issue not identified by the NOI that is of great importance to our members is reclamation following abandonment. The verified statement of William M. Rowlands, the president of Otter Creek Coal, LLC, included in the TRRC application states, "Based upon the projected rate of production and estimated coal reserves in the planned mining area of 330 million tons, the Otter Creek Mine should allow for nearly 20 years of mineable coal production." What happens to the TRR, its right-of-way, and all the other facilities and equipment proposed for construction when the coal is gone and there is no more reason for the railroad? The EIS should discuss the abandonment and final reclamation of the land transformed by the railroad. What will happen to the railroad right-of-way when there is no longer a use for the railroad? The STB should evaluate and determine in the EIS if a reclamation bond is required for this significant and realistic not-too-distant end point for this project.

Connected and Cumulative Impacts of the Project that Must be Examined in the EIS

The National Environmental Policy Act requires, through the CEQ's NEPA implementing regulations, that an agency must analyze any proposal in consideration of other actions that are connected (40 C.F.R. §1508.25(a)(1)) and are cumulative (40 C.F.R. §1508.7, §1508.25 (a)(2)).

Specifically, "connected actions" are defined as:

- those that are closely related and automatically trigger other actions that may require EISs;
- those that cannot or will not proceed unless other actions are taken previously or simultaneously; or
- those that are interdependent parts of a larger action and depend on the larger action for their justification.

The Ninth Circuit has explained that “[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement” (*Klamath-Siskiyou Wildlands Ctr.*, 387 F.3d at 998). “The purpose of this requirement is to prevent an agency from dividing a project into multiple actions, each of which individually has an insignificant environmental impact, but which collectively have a substantial impact” (*Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 969 [9th Cir. 2006]). In determining whether there is a connection between projects, this circuit employs an “independent utility” test (*Wetlands Action Network v. U.S. Army Corps of Eng’rs*, 222 F.3d 1105, 1118 [9th Cir. 2000]), *abrogated on other grounds by Wilderness Soc. v. U.S. Forest Serv.*, 630 F.3d 1173 [9th Cir.

2011]). The test asks whether “each of two projects would have taken place with or without the other.”

Specifically, Section 1508.7 defines "cumulative impacts" as: "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

A cumulative impact analysis “must be more than perfunctory: it must provide ‘a useful analysis of the cumulative impacts of past, present, and future projects’” (*Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 [9th Cir. 2002]). To be useful to decision makers and the public, the cumulative impact analysis must include “some quantified or detailed information: . . . general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided” (*Ocean Advocates v. U.S. Army Corps of Eng’rs.* 402 F.3d 846, 868 [9th Cir. 2005]).

As mandated by the Ninth Circuit Court of Appeals December 2011 decision, the STB in this current TRR EIS is required to not only address the cumulative impacts from coal bed methane development but also the development of the Otter Creek coal strip mine and impairments to water quality from all of these (and other) reasonably foreseeable projects (668 F.3d 1067 [9th Cir. 2011]). We believe that there are additional connected and cumulative impacts to this project, which we include and detail below.

Otter Creek Coal Strip Mine

As determined by the Ninth Circuit Court of Appeals and by the definitions above, the Otter Creek coal strip mine is integrally connected to the TRR project. One cannot and does not exist without the other. **The mining of Otter Creek coal will be a connected and cumulative impact of the TRR, if the railroad is built, and must be addressed in this EIS.**

In March 2010, St. Louis-based Arch Coal, Inc. was the successful bidder for a state coal lease of the Otter Creek Tracts. If fully developed Otter Creek would become one of the largest new coal mines in North America. It will be a massive strip mine. Currently there is no coal mining in the Otter Creek Basin. As stated above, Arch Coal owns a 34.68% share of the TRRC. The principle (perhaps “only” is a more appropriate word) purpose of the TRR is to transport Otter Creek coal.

However, the Arch Coal lease of Otter Creek does not authorize or permit any mining activity. As earlier determined by the District Court and reiterated by the Montana Supreme Court in its October 2012 finding, “. . . Arch Coal, by leasing the Otter Creek tracts from the State, acquired *'nothing more than the exclusive right to apply for permits from the State'*” [emphasis added].

In July 2012, Arch Coal, through its subsidiary Otter Creek Coal, submitted a permit application to the Montana Department of Environmental Quality (DEQ) for its Otter Creek mining plans. There are a number of processes that must be followed before this mine receives a permit from the State and is allowed to move forward with its plans.

First, under the DEQ's Coal Permit Application process, a coal permit application must be deemed complete before it can be analyzed and evaluated for whether or not it is acceptable. Arch Coal must also present plans for review and analysis that comply with the Montana Strip Mine Siting Act and the Montana Strip and Underground Mine Reclamation Act (Title 82, Chapter 4, Parts 1 and 2, MCA). A Montana Environmental Policy Act (MEPA) EIS must also be completed for the coal mine proposal and that EIS must include all the cumulative and connected effects of the project including, for example, the construction of the TRR.

All of the above (and other) processes must be completed before the DEQ issues any permit that allows mining at Otter Creek to go forward. Additionally, the State Land Board has retained final review of the project before it will be allowed to begin, which was reiterated in the Supreme Court's October 2012 finding: "Further, as the parties stipulated in District Court, the mine operation and reclamation plan must be reviewed and approved by the State Land Board."

The STB in its cumulative analysis of the TRR must include all the baseline information and analysis of the impacts that the Otter Creek Mine proposal will have on the environment and socioeconomics of the region. These projects are integrally tied to one another. One does not exist without the other. A critical question for the STB is: How will the environmental analyses and the compliance documents for these two inter-related projects be integrated?

As mentioned earlier, the verified statement of William M. Rowlands, the president of Otter Creek Coal, LLC, included in the TRRC application states, "Based upon the projected rate of production and estimated coal reserves in the planned mining area of 330 million tons, the Otter

Creek Mine should allow for nearly 20 years of mineable coal production." Not only are we concerned about what will happen to the Otter Creek Mine area when the coal has "played out," but what happens to the TRR, its right-of-way, and all the other facilities and equipment proposed for construction of that rail line when the coal is gone and there is no more reason for the railroad? The TRR EIS should discuss the abandonment and final reclamation of the land transformed by the railroad AND the mine.

Coal Export

By the definitions above, the issue of coal export is integrally connected to both the Otter Creek Mine and the TRR project. Our research shows that there will be a dramatic increase in coal export shipments from the Powder River Basin (PRB), which includes the Otter Creek Mine. In statements made by Arch Coal to the media and to their shareholders, the coal that the TRRC hopes to haul from the Otter Creek Mine (if it is permitted and built) is destined for the export market. Thus, **the issue of coal export is a connected and cumulative impact of the TRR and must be considered in this EIS.**

We believe that it is the responsibility of the STB to confirm all the statements about this project that the TRRC made in its application. We believe that the TRRC (and Arch Coal) has significantly understated the potential annual coal production numbers as well as the destination market for this coal. We believe that the STB must "connect all the dots" in this EIS. This includes not only the enormous impacts and consequences of the TRR short line, but also the connected and cumulative impacts resulting when the TRR joins with the existing Burlington

Northern Santa Fe (BNSF) east-west rail line that will carry the Otter Creek coal to its final destination.

The TRR is controlled by BNSF and Arch Coal (34.68% each). Arch Coal has the lease for the Otter Creek coal tracts, the commodity to be hauled by the TRR, and BNSF will operate the TRR. While some coal may move east, those markets have and continue to decline. As revealed in statements by Arch Coal, Otter Creek coal is destined for export from the Pacific Northwest to Asia.

In January 2011, when Arch Coal announced that it had acquired a 38% interest in Millennium Bulk Terminals – Longview (MBT), Steven F. Leer, Arch's chairman and chief executive officer stated: "This transaction gives us a direct stake in participating in the growth of U.S. coal exports off the West Coast." In May 2011, when Arch Coal established a new subsidiary, Arch Coal Asia – Pacific Pte. Ltd., Mr. Leer stated: "With an expanded presence in the Asia-Pacific region, Arch Coal expects to extend its reach and seize new market opportunities as developing countries demand more and more energy."

Arch Coal has made several other representations to investors and others that the Asian export markets would be the primary market for the Otter Creek coal via proposed new coal export terminals in the Pacific Northwest, in particular the proposed export terminal at Longview, Washington. If permitted and built, the Longview terminal could handle 48 million tons of coal each year. Not only is Arch Coal a major partner in this terminal, but the terminal is served by the BNSF railroad, a partner with Arch Coal in the TRR. BNSF has recently announced major

capital improvements totaling \$217 million in Montana and Washington to “maintain and improve rail capacity.” These improvements include the construction of a “new lead to access the Port of Longview.”

The amount of money Arch Coal and BNSF are projecting to invest leads to no other conclusion but that Otter Creek coal is bound for the export market. Arch Coal paid the State of Montana \$73 million for the Otter Creek coal tracts lease. BNSF is planning \$217 million in rail track capital improvements, including to the Port of Longview. Arch Coal and BNSF are among those investing in the \$600 million Longview Port expansion. Finally, Arch Coal and BNSF are investing \$490 million in construction costs of the TRR. All of this money, more than \$1.3 billion, is to move Otter Creek coal as well as other PRB coal to the Pacific Northwest for export to Asia, particularly China.

Arch Coal is the second largest coal-producing corporation in the U.S. supplying 13.8% of the nation's total coal production. The St. Louis-based corporation has holdings and mining complexes in Appalachia, Illinois, the Western Bituminous region, and the PRB. In 2009, 42% of the nation's coal came from the PRB, and 99% of this coal was used in the U.S. However, coal consumption has declined more than 20% since the year 2000, and continues to decline, due to a variety of reasons (e.g., energy efficiency, the increasing use of cheaper natural gas, more stringent regulation of air pollution, and the retirement of aging coal-fired power plants).

The growth in Asian coal demand is rising dramatically, and the U.S. Energy Information Agency predicts that nearly 90% of that increased use will be in China. The three coal companies

that dominate the PRB (Peabody Coal, Arch Coal, and Cloud Peak Energy) are all currently shipping coal to Asia – and publicly state that they intend to increase those shipments. To facilitate that goal, these coal companies have filed applications to build/expand several port facilities in Washington and Oregon. Arch Coal not only has interest in the port at Longview, Washington, it also has contractual agreements to use the Prince Rupert, British Columbia, coal export facility.

The opening of new coal export terminals in Washington and Oregon will have enormous impacts on the commerce and communities in Montana. There are multiple proposed terminals on the West Coast currently under environmental review, including Coyote Island Terminal at Boardman, Oregon, and the Cherry Point Terminal in Bellingham, Washington, or in pre-scoping stages, such as the Longview, Washington, port. If built, the Cherry Point and Longview ports together would be able to handle nearly 100 million tons of coal. Collectively, these projects would transform the region with traffic and rail congestion.

The effects of the port proposals extend far beyond the ports themselves and will result in systemic impacts on the entire rail transportation system of the region extending from southeast Montana and northeast Wyoming all of the way through central, northern, and western Montana; Idaho; Oregon; and Washington.

As mentioned earlier, in July 2012 WORC released a report titled, *Heavy Traffic Ahead* (see <http://www.heavytrafficahead.org/>). The report was prepared by Terry Whiteside (a consultant in transportation and marketing who is a former head of the Transportation Division of the

Montana Dept. of Commerce and currently representing most of the Wheat and Barley Commissions throughout the western half of the U.S.), Gerald Fauth, III (a transportation consultant with extensive experience as staff advisor in transportation for the STB and an independent consultant on economic, regulatory, public policy, and legislative issues primarily associated with or related to the U.S. railroad industry), and attorney Richard Streeter (who has experience in transportation law representing regulated and unregulated carriers as well as shippers, landowners, local communities, and state and local governmental agencies before the U.S. Department of Transportation and its multiple administrations, including the STB and its predecessor, the Interstate Commerce Commission). Key findings in the report are:

- U.S. coal export markets are headed for explosive growth. Coal export between the PRB and Pacific Northwest export terminals in Oregon, Washington, and British Columbia are projected at 75 million tons per year by 2017 and climbing to 170 million tons per year by 2022.
- While this coal export commerce would generate billions of dollars in annual revenues for railroad, coal, and port terminal companies, state and local governments would bear the brunt and burden of most of the related infrastructure costs in their localities and would likely be required to spend hundreds of millions of dollars in related mitigation, litigation, debt, and other costs associated with the necessary improvements to accommodate export coal traffic levels.
- The west-bound movement of coal is likely to disrupt the frequency and reliability of inbound and outbound shipments of containerized traffic and that traffic would likely experience diversion to California and Canadian ports.

- Export grain railroad traffic would be adversely impacted by the reduction of rail capacity and would likely experience deterioration of rail service, such as higher transit and cycle times, and would likely incur higher costs in the form of higher freight rates and equipment costs.
- Many areas along the routes would require major upgrading and expansion of existing tracks and related infrastructure, which could cost billions of dollars.
- While Burlington Northern Santa Fe (BNSF), Union Pacific (UP), and other railroads will be involved in the PRB to Pacific Northwest coal export transportation market, to some extent BNSF's routes are significantly shorter than the UP routes, and BNSF has a lower cost structure, thus, it will likely capture the lion's share of traffic and dominate the export market.
- The expected large coal volumes will result in several major choke points and bottlenecks and will likely cause rail congestion problems for the entire route, affecting Amtrak passenger service as well as other shippers.

The impacts to Montanans and Montana communities from increased rail traffic are real and significant – and these impacts will go far beyond "inconveniences." Based on PRB coal company projections, coal export will amount to at least 75 million tons of coal and as much as 170 million tons each year through Montana. Coal trains (today) are 120–125 cars long, and each car holds 115 tons of coal (and the TRR application states that that rail line will be built to accommodate 150 cars). By extrapolation, that means that Montana will likely see at least 30 more coal trains each day (15 loaded going west and 15 empty returning to the coal fields) – in addition to all the train traffic we currently experience. And, if all the West Coast ports are built

or expanded and the high-end coal company projections are met, Montana could potentially experience as many as 64 more coal trains (total east and west) each day. There will be health, safety, quality of life, as well as actual financial costs to Montana citizens and communities from this increase in coal train traffic. Billings, Montana, will be most affected by this increase in the number of coal trains as it is a bottleneck for rail traffic. All outgoing coal trains from the PRB headed for Pacific Northwest ports pass through Billings. The only other city so affected is Spokane, Washington. Many other sensitive areas, such as Glacier National Park (the BNSF rail line runs along the southern border of the park), will be impacted. The TRR will be integrally tied to this increase in coal train traffic as all the coal it transports is destined for export.

The increased number of trains will mean more noise, a greater potential that emergency responders will be delayed in reaching residents when there is a medical emergency (or a fire or the need for police), and a greater potential for vehicle collisions with trains and for pedestrian accidents.

More trains will mean an increase in the amount of airborne pollutants (particulate matter) from diesel engines as well as from coal dust. Medical studies have shown a clear link between both diesel air pollutants and coal dust and disease. While those with chronic disease, the elderly, young children, and pregnant women are most at risk, the health effects from particulate matter exposure may occur years later, so even healthy individuals need to be concerned.

We often don't think of noise as a health issue beyond the obvious link of loud noise exposure to hearing impairment and deafness, but the medical literature does link noise to significant human

health issues. Federal law requires train engines to blow their horn when approaching a crossing whether that crossing has guard arms that come down or not. There is a process that communities can go through to establish "Quiet Zones." But, the citizens of the community wanting the Quiet Zone generally pay for the infrastructure upgrades required to allow trains to not blow their horns.

It is true that if a rail company needs to upgrade their track or a bridge or a crossing in order to facilitate current or increased train traffic, they will do so and they will pay for it. However, if a city or county wants to have a particular crossing in their community upgraded to deal with local impacts and the rail company doesn't need to do this in order to facilitate increased train traffic, under existing law the railroads do not have to respond to these local government concerns. The only choice citizens have at that point is to pay for any upgrade with public money – taxes from somewhere be it federal, state, county, or municipality taxes.

The STB must include a hard look at the coal export issue in the TRR EIS. It is a significant connected and cumulative impact of the TRR proposal. We believe that there is one purpose for this railroad and one purpose only – to haul Otter Creek coal to West Coast ports for shipment to China. To strip and ship Montana resources for export to China not only destroys the environment and agricultural economy of a productive rural valley but also the health, safety, agricultural economy, and general commerce of Montana as well as the entire Pacific Northwest region through which these trainloads of coal-to-China will pass.

Coal Bed Methane Development

While coal bed methane (CBM) development in Montana is at a standstill due to the cheaper production costs and quicker production time that are the advantage for deep oil and gas development, ongoing CBM production in Wyoming continues to impact southeastern Montana. And, it is conceivable that within the foreseeable future CBM development will resume in Montana. **The construction and operation of the TRR must be evaluated considering the direct, indirect, and cumulative impacts that CBM development and production has and could increasingly have on the region.**

The same farmers and ranchers who could face the construction of miles of access roads and pipelines, hundreds of well pads, compressor stations, and the construction of impoundments to dispose of methane wastewater are the ones who face the impacts from the construction and operation of the TRR.

When and if CBM development and production occurs in the immediate area proposed for development by the TRR, numerous cumulative impacts would occur to farming and ranching operations including but not limited to:

- cumulative noise impacts on the silence and solitude of the valley,
- cumulative impacts on everyday ranching operations from the construction of roads and the railroad and resulting bisecting of pastures and irrigated fields,
- the loss of productive acres from surface disturbance,

- impacts on irrigation diversion and transportation structures from increased suspended sediment caused by increased erosion and sediment loading,
- impacts to water quality (see further discussion below),
- loss of property value,
- air quality impacts including visibility impairment and degradation, potentially of Class I air sheds,
- increased dust affecting air quality, vegetation, and livestock,
- increased traffic on county, state, and private access roads and the resulting increased accident rates,
- increased trespass caused by the increased access to private ranch lands,
- increased risk of fires, and
- increased infestation and spread of noxious weeds.

These direct cumulative impacts on farms and ranches will have indirect cumulative impacts on the region's economy – an economy heavily dependent on agriculture sector jobs. The STB must consider the added and potentially devastating cumulative impacts on the farming and ranching community from continued and potentially increased CBM development projects.

Oil and Gas Development

As mentioned above, oil and gas development and production has risen dramatically in the past few years. While the Bakken formation in eastern and northeastern Montana and North Dakota is the current focus of such development, production companies are exploring other regions of

Montana, including the areas near where the TRR is proposed for construction. **Oil and gas development is a connected and cumulative issue that must be addressed in the TRR EIS.**

Water Quality

Water quality standards for sodium adsorption ratio (SAR) and electrical conductivity (EC) were implemented by the State of Montana after a long and detailed process before the Montana Board of Environmental Review (BER). The BER addressed this issue in 2003 and 2006. Soils and underground aquifers in coal seams are highly laden with sodium salts. Discharge of these waters impacts the surface water quality. Numeric standards for the Tongue River as well as narrative standards for its tributaries mean that the TRR is restricted in how it impacts the Tongue River. The water quality of the region is critical to the agricultural health and survival of ranches. **The connected and cumulative issue of water quality and its potential impairment by the TRR must be considered in the EIS.**

The Burning of Coal and its Relationship to Global Climate Change

When Congress passed NEPA in 1969, one of its authors, Senator Henry Jackson, described the Act this way: "[NEPA] provides a statutory foundation to which administrators may refer. . . for guidance in making decisions which find environmental values in conflict with other values. . . [NEPA] is a Congressional declaration that we do not intend, as a government or as a people, to initiate actions which endanger the continued existence or the health of mankind [and] that we

will not intentionally initiate actions which will do irreparable damage to the air, land, and water which support life on earth. . . ."

In the EIS being prepared for the TRR, **the STB must give full consideration to the long-term indirect effects that the mining and combustion of Otter Creek coal presents as a cumulative impact of the TRR project.** The sole purpose of coal mining is to generate fuel that will be burned in an effort to extract energy. Although all fossil fuels contribute to climate change, coal's contribution is by far the most significant. The sole purpose of the TRR is to haul Otter Creek coal to the Pacific Northwest for shipment to China and other Asian nations where it will be burned, often in plants where there are few, if any, air pollution controls in place.

The National Environmental Policy Act requires that federal agencies consider "any adverse environmental effects" of their major actions (42U.S.C. §4332(C)). The CEQ regulations implementing NEPA explain that "effects" include both direct and indirect effects. Indirect effects are defined as those that "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 C.F.R. §1508.8). The Eight Circuit in *Mid-States Coalition for Progress v. STB* held that the STB could not approve the building of a rail line without first examining the effects that may occur as a result of the reasonably foreseeable increase in coal consumption; stating that "degradation in air quality is indeed something that must be considered in an EIS if it is "reasonably foreseeable" (345 F.3d 520, 549 [2003]). Additionally, the Court explained that while the extent of the degradation in air quality may be speculative, the nature of the effect would not be and, thus, must be addressed in the EIS.

It is now well-established in the scientific community that the burning of coal and other fossil fuels is putting us on a dangerous path toward irreversible climate change. According to the U.S. Global Change Research Report (2009), "The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come from the burning of fossil fuels (coal, oil, and gas), with additional contributions from the clearing of forests and agricultural activities."

There have been a series of legal and policy developments in the past decade relating to the regulation of greenhouse gas (GHG) emissions and assessment of federal actions that may affect climate change. For example:

- The Supreme Court's decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007) acknowledging the emerging scientific consensus on the dangers posed by climate change and holding that CO₂ and other GHG are "air pollutants" under the Clean Air Act subject to EPA's [Environmental Protection Agency] regulatory authority. The Court directed EPA to "decide whether greenhouse gases cause or contribute to climate change" and thereby endanger public health or welfare, which the agency did in 2009. The EPA concluded that "greenhouse gases in the atmosphere endanger the public health and welfare of current and future generations." *See* 74 Fed. Reg. 66,495, 66,496 (Dec. 15, 2009).
- The United States Global Research Program Report, *Global Climate Change Impacts in the United States*, documents the impacts of global climate change, including the increased likelihood of more frequent and more intense heat waves, more wildfires, degraded air quality, more heavy downpours and flooding, increased drought, greater sea

level rise, more intense storms, harm to water resources, harm to agriculture, harm to wildlife and ecosystems, and ocean acidification.

- EPA adopted the nation's first carbon emission regulation establishing fuel-economy standards for mobile sources starting with cars and light trucks.
- EPA adopted the "Tailoring Rule" subjecting stationary sources such as coal-fired power plants to regulation of GHG emissions if they emit GHG emissions of at least 100,000 tons per year even if they do not exceed the permitting thresholds for any other pollutant.
- In 2010, the National Academy of Sciences published a report, *America's Climate Choice*, that details the impacts already underway in the US, as well as policies and actions that are necessary to mitigate and adapt to climate change, including the use of existing agency authorities to reduce reliance on fossil fuels.

In February 2010, CEQ published *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. The guidance document "advises Federal agencies to consider, in scoping their NEPA analyses, whether analysis of the direct and indirect GHG emissions from their proposed actions may provide meaningful information to decision makers and the public." When the U.S. State Department drafted its EIS for the Keystone XL Pipeline, it carefully followed the CEQ guidelines and analyzed both the direct and indirect impacts of GHG emissions of the proposed pipeline (Final EIS Keystone XL Project 3.14.3.14). The STB should follow the example set by its counterpart agency and similarly follow the CEQ guidelines advising consideration of both direct and indirect increases in GHG emissions.

We believe that the TRR directly and indirectly contributes to significantly increased GHG emissions as the TRR is integrally tied to the burning of coal as its sole purpose is to haul Otter Creek coal, which will be burned for energy generation. In *Border Power Plant Working Group v. Department of Energy*, the Court determined that emissions resulting from the operation of a turbine were “effects” of the transmission line that would transport the energy and, therefore, must be analyzed under NEPA (260 F.Supp.2d 997, 1017 [S.D. Cal. 2003]). Similarly, emissions from the burning of the coal that would be transported by the TRR are an “effect” that the STB must consider in drafting the EIS.

Virtually every ecological community and natural system in Montana is already being impacted by global climate change. These impacts will continue to become more and more severe unless the use of coal is dramatically curtailed and all nations make a concerted effort to develop other forms of energy. Wherever the Otter Creek coal is burned, the GHG emissions will eventually impact Montanans.

Within the last century, Montana has seen a 1.3°F increase in its average temperature (*Climate Change and Montana*, EPA, 1997). The Intergovernmental Panel on Climate Change has projected that, within the 21st century, temperatures will increase 4°F in the spring and summer months and 5°F in fall and winter. Warmer temperatures are:

- leading to a loss of snowpack through earlier snowmelt with resulting effects on the water supply available for humans, livestock, crops, fish, and wildlife. Snowpack in Montana holds about 75 percent of the State’s water supply. Less snowfall and earlier snowmelt affects aquifer recharge, stream flow, and stream temperature. Early snowmelt also

produces an increase in stream flow in winter and spring but a reduction in summer and fall flows. This is detrimental because the summer and fall flows are critical for irrigation, power generation, fishery protection, recreation, and other uses.

- leading to extreme heat waves. In general, heat waves are already occurring at a more frequent rate, thereby increasing mortality and morbidity. EPA studies indicate that Montana is particularly susceptible to more heat waves since it already has irregular, intense heat waves as part of its weather pattern. Heat waves produce a variety of problems, including increased fatalities among the elderly and other vulnerable populations. They also increase the spread of pests and invasive species. In reference to pests, EPA has reported that mosquito populations having the potential to carry encephalitis already exist in Montana. As conditions become warmer, the habitat for disease-spreading insects and pathogens will likely expand and create a greater risk of infection for Montanans.
- increasing the danger of wildfires. Wildfires are already becoming more prevalent and destructive in Montana, especially during summer months. During the period from 2000 through 2007, three National Forests in Montana experienced a loss of over 1,420,000 acres of land due to wildfires. Moreover, in fiscal year 2008 alone, Montana spent \$84.3 million on fire and damage control. These costs to the State will only increase as global warming escalates. Wildfires also release huge quantities of CO₂ thereby creating a feedback loop that drives global warming ever higher.

Climate change is expected to have significant impacts on water supplies and the productive capacity of agricultural lands. In Montana, agriculture is a \$1.8 billion business, comprising 64%

of the state's land area. In Montana, the most noticeable signals for climate change include an earlier snow melt, an earlier start to the spring growing season, and a more pronounced mid-summer drought period.

According to Steve Running, a University of Montana climate scientist, thirty years ago snow melts occurred around the beginning of April. In recent years, they have occurred in mid-March. It is conceivable that in 30 years snow melts will occur in late February if this trend continues. The growing season currently begins a month earlier than it did 30 years ago, and summers are longer, hotter, and drier with lower river flows and more wildfires.

Again, we believe that the STB must give full consideration to the long-term indirect effects that the mining and combustion of Otter Creek coal presents as a connected and cumulative impact of the TRR project. If we honestly calculated the true costs of coal to the land, to our health, and to our planet, coal would not be cheap. But the significant costs of coal are shifted into the future and onto others, thus, giving coal the illusion of being cheap.

Conclusion

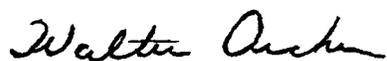
Northern Plains has opposed the building of this railroad since it was first proposed in the 1980s. We continue to vigorously oppose the construction of the TRR, and we will fully participate in this current EIS process. These comments are submitted on behalf of our membership, especially those who live in the shadow of this long-speculative project. We do not believe that this railroad

deserves to be granted the status of “public convenience and necessity.” We continue to believe that the “no-action” alternative should be chosen.

We believe that the STB must fully consider the consequences of this project’s significant and severe – in many cases irreparable – impacts to the numerous non-mineral resources in the project area; the agricultural economy and vitality of area residents; the cultural values this area holds for many Native American tribes; and the health, life, and safety of the area’s inhabitants and those in the rest of Montana traversed by the coal export rail lines. These impacts must be balanced against the knowledge that the benefits of this project are not going to the American people – those go to the coal and rail company executives and shareholders. Additionally, the coal – one of our nation’s energy resources – will not be used in our nation but will be exported to our nation’s economic competitors. And, finally, Montanans – and the rest of the American people – will suffer the myriad of costs of this project.

These comments are submitted with the hope that this EIS prepared by the STB will bring substantive and meaningful information together so that a fully informed decision on this project can be made. Indeed, that is our expectation.

Sincerely,

A handwritten signature in cursive script that reads "Walter Archer".

Walter Archer, Chair
Northern Plains Resource Council

APPENDIX 43



Ken Blodgett
Surface Transportation Board
395 E Street SW
Washington, D.C. 20423-0001

Attention: Environmental Filing, Docket No. FD 30186

January 9, 2013

Dear Mr. Blodgett:

On behalf of Northern Plains Resource Council (Northern Plains) members, I am submitting the following additional scoping comments to the Surface Transportation Board (STB) in response to its November 1, 2012, decision that directed the Tongue River Railroad Company (TRRC) to file supplemental information related to the transportation merits of the revised line that the TRRC now proposes to build as outlined in its original application submitted on October 16, 2012. **These comments are in addition to the comprehensive December 5, 2012, comments prepared by Northern Plains on the original October 16, 2012, application (herein attached)** and are in response to the revised TRRC application submitted on December 17, 2012. Please ensure that **all** of our comments are entered into the public record. **Also included as part of Northern Plains' comments (and herein attached) are the previously submitted "Petition to Revoke Supplemental Application" prepared for Northern Plains by Attorney Jack R. Tuholske along with the "Changes in Market" report prepared by Power Consulting, Inc., and the verified statement of Gerald W. Fauth III.**

Northern Plains has fought the Tongue River Railroad (TRR) since it was first proposed in the 1980s. But through all the tricks, twists, and turns we have seen the TRRC employ in our long history with this specious project, even we have been amazed at what has occurred since October 16. The speed with which the STB issued its decision – on October 22 – that included a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) as well as a draft scope of study for the EIS, a scheduling of scoping meetings, and a due date for scoping comments of December 6, 2012, was breath-taking and unprecedented. How could the STB so quickly process that application and issue its decision?

Then, 10 days later on November 1, 2012, the STB issued a new decision directing the TRRC to submit supplemental information for their original application. (It makes one wonder if the STB finally read the application and realized that it was severely lacking in project information, to say the least.) This supplemental information was due December 17. However, even though no one knew what supplemental information would be provided and, thus, did not fully understand what

the proposed project would be, the STB held the public scoping meetings “on schedule” November 12 through 16.

As we now know, the December 17 application supersedes the original application, and, rather than simply supplementing the record to include additional information regarding the “transportation merits” associated with TRRC’s October 16th application as requested, the application submitted by the TRRC totally changed the configuration and alignment of the proposed railroad from what had been proposed and promoted for nearly 30 years. Even though the scoping comment deadline was extended to January 11, 2013, this chain of events necessitates – we believe requires – that the STB step back and re-start the entire process, including the public involvement process.

If individuals are not parties of record to this STB project, they may not be aware of the project proposal changes despite any published public notices – this has all occurred during the end-of-year holiday season when many people are gone and/or preoccupied. Consequently, members of the public who commented at the mid-November public scoping meetings may not realize they need to submit additional written comments to address this new alignment even though they could have valid concerns that need to be expressed and addressed. And, importantly, landowners who live along the new proposed route have not been properly involved in this process. We wish to register our strong protest to what we consider a flawed and unfair process and to urge the STB to start over with a new NOI and draft scope of study for the EIS that must be prepared.

We firmly believe that this December 17 application is an entirely new project. This application represents what we believe should be called TRR IV.

Through the entire many-years process for the TRR as well as through all the subsequent proceedings and court cases involved with TRR II and TRR III, the TRRC has promoted – and received ICC (Interstate Commerce Commission) and STB approval for – its preferred original route from Ashland northeast along the Tongue River to Miles City. Indeed, TRRC’s original October 16, 2012, application sought to simply re-open the original docket to build the rail line based on their contention that the application was simply a “modifi[cation] by refinements” of the approved TRR I route. (It should be noted that Northern Plains very much objects to and disagrees with this claim.)

However, the new route proposed in the December 17 application no longer goes from Ashland to Miles City. It is deception to describe this newly proposed route as simply an amendment to the original TRR I route. As stated on page 2 of the application: “TRRC previously proposed in its October 16 Revised Application the construction of a line between Miles City, MT and Ashland/Otter Creek, MT following with some modification the alignment for the TRRC rail line approved by the ICC. However, *TRRC herein proposes as its preferred alignment a different routing* [emphasis added], hereafter referred to as the ‘Colstrip Alignment.’”

That this is truly a new application is also supported by the fact that not only does Burlington Northern Santa Fe Railroad (BNSF) own 1/3 of the TRR, but also “BNSF is expected to be the

sole operator over TRRC's rail line . . ." (page 11, December 17 application). One could posit that this is really a BNSF project, and, thus, a new application is necessary.

Additionally, we are incredulous that a route that was originally rejected by the TRRC because of engineering problems as well as the added costs and mileage to stated markets has now mysteriously become feasible. We need to more fully understand what these new "refinements" are in order to understand TRRC's abrupt turn-around from their previous and long-standing advocacy of the route from Ashland along the Tongue River to Miles City. We also note here that the "Colstrip Alignment" was rejected by the ICC in 1986.

Frankly, what we see in the December 17 application is that the TRRC has finally recognized that something like the Colstrip Alternative more logically moves the Otter Creek coal it proposes to transport to West Coast ports for shipment to China and other Asian countries. However, we note that the new application continues to use subterfuge in describing the destination markets for the coal being transported. Under the National Environmental Policy Act, an agency is required to accurately describe the "Purpose and Need" for a project. To date, the TRRC has not admitted the real purpose for this railroad, thus, the need for this railroad cannot be ascertained.

We believe that it is the responsibility of the STB to question and confirm all the statements that the TRRC makes in its application about this project.

For example, we believe that the TRRC has misstated the destination market for the coal it hopes to transport. Details are found in our December 5, 2012, scoping comments, but suffice to say here: the market for coal in the United States has and continues to decline, and the growth in Asian coal demand is rising dramatically. As is well-known, the TRR is controlled by BNSF and Arch Coal (34.68% each). Arch Coal (the lease holder of the Otter Creek coal tracts) has made several representations to investors and others that the Asian export markets would be the primary market for the Otter Creek coal via proposed new coal export terminals in the Pacific Northwest. In particular, Arch Coal is a major investor in the proposed export terminal at Longview, Washington. The port of Longview is serviced by the BNSF Railroad, the railroad that will operate the TRR.

Second, we again question why Terminus Point #1 is included in this application when there is no Montco Mine (nor is there a state permit to develop such a mine) or any valid proposal for any other mine in this area. Why is Terminus Point #1 included when the amount of coal to be transported from this location is "0"? No such terminus point is needed, so it should not be built.

Alternatively, if there are any valid plans for new mines being discussed that would be serviced by Terminus Point #1, then we strongly believe those plans need to be revealed and incorporated into this application and EIS. This is critical because any such plans will alter the total amount of coal that will be shipped via the TRR.

Frankly, we believe that the statements in the application that only 20 million tons of coal will be shipped are so-calculated to avoid greater scrutiny by the STB. This tonnage conveniently represents 3.7 loaded (coal-bearing) trains or 7.4 total trains each day. If the true amount of coal

to be shipped was revealed, the total number of trains would most likely be more than 8 each day. This number of trains would trigger the STB's threshold for incorporating "downstream" impacts to all other areas and communities that would result when the TRR traffic is added to the rail system.

The STB needs to question and compel the TRRC to explain why it is asking for a 200-foot right-of-way if the application is really based on the TRR being a "single-track." There is only one reason for such a wide right-of-way: this rail line will eventually be double-tracked in order to handle more trains. Arch Coal and the BNSF Railroad, majority owners of TRR, plan to transport more than 20 million tons of coal. Those plans need to be acknowledged in the application so that the EIS being prepared by the STB properly identifies the "downstream" impacts of this project and analyzes the environmental consequences.

Again, we believe that it is the responsibility of the STB to question and confirm all the statements that the TRRC has made in its application about this project. It is imperative that the STB "connect all the dots" in reviewing this application as well as in the preparation of the EIS. This includes determining both the true destination and a more accurate total amount of coal that will be transported by the TRR. It includes not only the enormous impacts and consequences of the TRR short line but also the connected and cumulative impacts resulting when the TRR joins with the existing BNSF east-west rail line that will carry the Otter Creek coal to its final destination.

Again, we believe that the December 17, 2012, application must be treated as a new project – TRR IV. We believe that the STB must issue a new NOI and draft scope of study for the EIS and hold new scoping hearings.

As stated in our December 5, 2012, scoping comments, Northern Plains firmly believes that a determination of the "transportation merits" of the TRR – whether or not this railroad serves a "public convenience and necessity" – cannot be fully ascertained until after the environmental analysis of the impacts of the project and the accompanying public process are completed. This is especially true as this December 17 application represents a new proposed rail line route. Consequently, **we urge the STB to make the determination on the TRR's "public convenience and necessity" after the EIS process is complete.**

Additional Issues That Must be Thoroughly Analyzed and Evaluated in the EIS

The issues raised in our December 5 scoping comments are applicable and incorporated by reference into these comments that we have prepared for this new project, called the "Colstrip Alternative." There are some specific additional concerns raised by this new application that we wish to include as part of our scoping comments.

The total lack of clarity for the location of the 8,500-foot passing siding and the three set-out tracks that will be 500- to 4,000-feet in length is extremely problematic for landowners along the Colstrip Alternative. Without understanding these significant proposed aspects of the project, it is difficult for any landowner or concerned citizen to know what might be in store for areas along the route of potentially critical importance to wildlife or other natural resources, cultural resources, and/or ranching operations.

What improvements/impacts to both the Greenleaf Road and Cowcreek Roads will be necessary if the Colstrip Alternative for the TRR is approved? Who will pay for these changes to the roads?

The town of Colstrip is now directly and significantly impacted by the trains that the TRRC proposes to send along this new rail line to its connection with the BNSF line north of the community. How will the TRRC mitigate the impacts to Colstrip? The increased time that rail crossings are blocked, thus impacting emergency services as well as normal traffic as well as the increase in noise, coal dust, and diesel fumes must be addressed in the EIS.

Further, the new route alternative to Colstrip will likely negatively impact the existing coal mines at Colstrip and even Hardin. It is possible that these mines could even be shut down. This would mean that stable communities could face a socioeconomic crisis that is the opposite of the one that could be faced by Ashland. This EIS must include a thorough and honest socioeconomic analysis of what this TRR proposal means for the region's people, communities, services, stability, and economic structure.

Conclusion

As stated in our December 5, 2012, scoping comments, Northern Plains has opposed the building of this railroad since it was first proposed in the 1980s. We will fully participate in the EIS process. However, we continue to vigorously oppose the construction of the TRR, no matter what alignment is proposed.

We believe that the December 17, 2012, application must be treated as a new project – TRR IV. We believe that the STB must issue a new NOI and draft scope of study for the EIS and hold new scoping hearings. We believe that it is imperative that the STB question and confirm all the statements that the TRRC makes in its application about this project. We do not believe that this railroad deserves to be granted the status of “public convenience and necessity,” and we firmly believe that that status should not be granted until after the EIS process is completed. We continue to believe that the “no-action” alternative should be chosen.

We believe that the STB must fully consider the consequences of this project's significant and severe – in many cases irreparable – impacts to the numerous non-mineral resources in the project area; the agricultural economy and vitality of area residents; the cultural values this area holds for many Native American tribes; and the health, life, and safety of the area's inhabitants and those in the rest of Montana traversed by the coal export rail lines. This is true no matter how many miles of track the TRRC proposes to lay – a reduction in miles does not equate to a reduction in impacts.

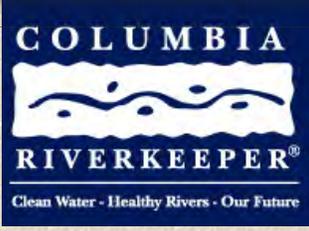
The impacts from the TRR must be balanced against the knowledge that the benefits of this project are not going to the American people – those go to the coal and rail company executives and shareholders. Additionally, the coal – one of our nation's energy resources – will not be used in our country but will be exported to our nation's economic competitors. And, finally, Montanans – and the rest of the American people – will suffer the myriad of costs of this project.

These comments are submitted with the hope that the EIS prepared by the STB will bring substantive and meaningful information together so that a fully informed decision on this project can be made. Indeed, that is our expectation.

Sincerely,

Walter Archer, Chair
Northern Plains Resource Council

APPENDIX 44



[Home](#) » [Our Work](#) » Dirty Coal Export

Dirty Coal Export

Dirty Coal Export Targets the Columbia

Coal companies are targeting the Columbia River as the gateway for coal export. Massive terminals would send staggering quantities of U.S. coal to Asia. The Millennium terminal, proposed by Australia-based Ambre Energy and coal giant Arch, plans to export up to 60 million tons of strip-mined coal per year from the Powder River Basin through a port in Longview, Washington. A second proposal by Peabody Coal near Bellingham, Washington, proposes to export up to 50 million tons of coal per year. Check out Columbia Riverkeeper's in-depth public comments to the [U.S. Army Corps of Engineers](#) and the [Oregon Department of State Lands](#) on the first proposed coal export project in Oregon – Ambre Energy's Morrow Pacific Project.



Coal Export is Dirty

The proposed coal terminal on the Columbia and trains carrying coal would pollute our air, water, and communities. Watch this disturbing video of a coal train in Pennsylvania.

More Info

- [Coal Export: A History of Failure »](#)
- [The Aquatic Impacts of Coal Export »](#)
- [The Health Impacts of Coal Export »](#)
- [Our Success in Opposing Coal Export »](#)
- [Watch Our New Coal Export Film »](#)
- [Coal Barges Threaten the Columbia »](#)
- [Coal Export: More Information »](#)

STAY INFORMED VOLUNTEER DONATE »

Events

April 2013

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

« Mar May »

Oregon LNG Loses Again

Oregon LNG has failed in its attempt to keep Clatsop County from voting on an LNG pipeline application. The Supreme Court decision allows the County evaluate all the impacts of gas export.

[Read More and Comment »](#)

Coal dust can contain toxic pollution, including arsenic and polyaromatic hydrocarbons. For farmers, landowners, and communities along the rail lines, coal dust is more than a nuisance—it's a public health issue. While the video may show an unusually high level of dust, even Burlington Northern Santa Fe (BNSF) acknowledges that coal trains spill a lot of dust. BNSF's studies show that 500 pounds of coal can be lost in the form of dust from each rail car. Each 100-car train, therefore, may spill 50,000 pounds of coal dust into our rivers and towns. BNSF's website stated that "the amount of dust that escapes from PRB [Powder River Basin] trains is surprisingly large." BNSF has removed this page from its website, but our allies at the Sightline Institute captured the image in the amusing post titled "[At Least The Website Is Clean.](#)"



Coal dust blowing from the coal terminal will foul the air and water, as well as homes, boats, and businesses up to several miles away. For example, the Westshore coal terminal in British Columbia is located three miles from residences, yet homes are still covered with coal dust.

Coal Export is Bad for the Economy

The Port of Vancouver's Operation Manager, Mike Schiller wrote: "Coal is the most risky bulk mineral market. Consuming markets have no loyalty and will quickly shift to the cheapest market. Prices and markets can change before a facility is completed. . . . Because this is a fickle market, there is real danger in losing investment – both in construction capital and lost opportunity in a poorly performing asset (i.e. a single commodity terminal handling lower than expected volumes)." Coal export requires a small workforce and wastes hundreds of acres of waterfront property to store raw coal. Millennium displaced 50 employees when it bought the waterfront property and they plan to produce just 20 additional jobs. It's not worth the risk. The proposed 460-acre coal export site has tremendous potential for thousands of jobs in light industrial and smart-tech growth, instead of being mired in a single commodity dirty export trade.

Coal Export Would Reverse Washington's Clean Energy Gains

While Washington invests in clean technology jobs for wind, wave, and solar energy, the coal export terminals would reverse major commitments to reduce the state's contribution to global warming pollution. The coal export proposals come on the heels of Washington's popular 2007 legislation restricting coal plant development, Governor Gregoire's Executive Order on Climate Change, and both Washington's and Oregon's efforts to end their dependence on coal-fired power.

Take Action!

Across the Northwest, people are banding together to take a stand against coal export. Join the movement to protect Columbia River communities from coal export.



Contact Peter Goldmark, Commissioner of Public Lands in Washington State

The Washington Department of Natural Resources (DNR) will make critical decisions on whether state-owned aquatic lands can be used to support coal export terminals. Contact the head of DNR—Peter Goldmark—and tell him to deny any permit applications for dirty coal export on the Columbia River. Email or call Commissioner

Coal Spills Exposed

New tests show that coal is already polluting the Columbia River. Monitoring efforts discovered coal spilled at dozens of locations near rail lines in the Gorge.

[Read More and Comment >](#)

Port Seeks Land Use Permit for Coal

Port of St. Helens is seeking to convert over 900 acres of agricultural land for use as a potential coal pile for Kinder Morgan's export proposal.

[Read More and Comment >](#)

WA & OR Governors ask Obama Administration for Full Review of Coal Leasing and Export

Into Eternity

Riverkeeper and Senator Murray's Office Meet to Discuss Hanford

Ambre Energy Permit Delayed Until September 1st, 2013

Aveda Earth Month 2013

Rallies Call on Governor Kitzhaber to Reject Coal Export Permits

Informational Meeting Before Columbia County Land Use Hearing

Goldmark at cpl@dnr.wa.gov or 360-902-1004.

Contact Washington's Governor Gregoire

Tell Governor Gregoire that you support clean air and water, not dirty coal export. Call the Governor's office at 360-902-4111.

Contact Oregon's Governor Kitzhaber

Tell Governor Kitzhaber that Oregon should be a national leader in protecting communities and families from dirty coal export proposals. Urge the Governor to take a strong stand against coal export from Oregon's shores. Contact the Governor at 503-378-4582.



Riverkeeper is a proud member of [Power Past Coal](#).

[Contact](#) | [Privacy Policy](#) | [Terms & Conditions](#) |

© 2013 Columbia Riverkeeper, All Rights Reserved.

Powered by [Elliott Design](#)

APPENDIX 45

At Least The Website Is Clean

What the railroads don't want you to know about coal dust.

Eric de Place on August 10, 2011 at 9:24 am



This post is part of the research project: [Northwest Coal Exports](#)

Coal dust is a problem for railways. It escapes from rail cars during shipping, creating safety and congestion problems. It's toxic, unhealthy, and obviously unpopular with nearby communities.

And yet... [coal is the single biggest source of revenue](#) for freight railways. So when debate about new export terminals turns to coal dust, what's a railroad to do? According to BNSF—shipper of Powder River Basin coal to the Northwest—the answer is: *scrub your website*.

They recently removed some important information about coal dust. Fortunately, I can right-click like nobody's business. So, for the sake of posterity and public policy alike, I give you a screenshot of [the original version of BNSF's guide for freight customers](#), "Coal Dust Frequently Asked Questions."

avoid safety hazards, congestion and delays that can result from compromised rail infrastructure.



Joint Line - MP 69
Enlarge



Joint Line - MP 29
Enlarge

▲ Top

How extensive is the coal dust problem?

The amount of coal dust that escapes from PRB coal trains is surprisingly large. While the amount of coal dust that escapes from a particular coal car depends on a number of factors, including the weather, BNSF has done studies indicating that from 500 lbs to a ton of coal can escape from a single loaded coal car. Other reports have indicated that as much as 3% of the coal loaded into a coal car can be lost in transit. In many areas, a thick layer of black coal dust can be observed along the railroad right of way and in between the tracks. Given the high volume of loaded coal trains that move each day in the PRB, large amounts of coal dust accumulate rapidly along the PRB rail lines.



Undercutting ballast tailings
Enlarge



Note coal dust accumulation
alongside track
Enlarge

BNSF has been shipping coal from the PRB for decades - why is this coming up now?

The volume of coal transported out of the PRB over the Joint Line by BNSF and UP has increased

You read that right. BNSF says that "500 pounds to a ton of coal can escape from a single loaded car." Coal dust accumulates in the ballast between the rails, undermining the track structure and causing [derailments](#). And coal dust deposits sometimes even cause fires.

In addition to what BNSF once acknowledged on its website, the US Department of Transportation classifies coal dust as a "[pernicious ballast foulant](#)" that can weaken and destabilize rail tracks. Although there are ways to reduce or eliminate coal dust escaping during transit—such as reducing the amount of coal per car or covering loads with tarps or sprayed-on chemical sealants—the [measures are unpopular with coal shippers](#) because they add to the cost of moving coal. It will be interesting to watch how this issue plays out now that BNSF won [a ruling from the Surface Transportation Board](#) (STB) that will require coal cars to reduce coal dust escape, perhaps by as much as 85 percent.*

Assuming that the new rules can be enforced, the coal dust problem may be limited to "only" 75 to 300 pounds of coal dust settling on nearby communities. Too bad it's potentially *300 pounds per rail car*, and rail line communities between the Powder River Basin and Washington ports are looking at perhaps 18 trains per day, each of them roughly 125 cars long.

* Technically speaking, BNSF "lost" the case because the STB ruled that BNSF's tariff on coal shippers was not allowable. STB did, however, also rule that BNSF can require coal shippers to perform measures that significantly reduce the escape of coal dust.

Read more in [Climate & Energy](#), [Environment](#), [Land Use & Transportation](#)

Comments

don says:

August 10, 2011 at 4:56 pm

Did BNSF really scrub their website or did they update the page to inform their customers and reflect the new STB regulations? I found the page, perhaps you should look a little harder:

<http://www.bnsf.com/customers/what-can-i-ship/coal/coal-dust.html>

[Reply](#)



Eric de Place says:

August 11, 2011 at 8:41 am

Don,

I'm aware that the webpage still exists in altered form, but you can color me unconvinced. BNSF removed the specific numbers about coal dust escape; they removed all photos of coal dust blanketing the tracksides in the PRB region; and they removed any mention of the derailments caused by coal dust weakening the tracks. All of that information is helpful context not only for potentially affected communities, but also for shippers using the railway.

[Reply](#)

don says:

August 11, 2011 at 1:01 pm

I'm thinking that the only reason that BNSF put the information on their website in the first place was to convince customers of the reason for the tariff (a rule requiring customers to mitigate loss). You make it out to be some evil, nefarious thing that it was removed. Now that the STB has ruled that BNSF can require mitigation, the specific amounts of loss may not be important from the railroad's point of view (in that they were trying to justify mitigation measures).

Have you even tried to look in the STB archives for that information? It should be a matter of public record if the information was used by the railroad in testimony before the board.

Stop looking for boogey men under every bed and do a little investigation before jumping to conclusions.

[Reply](#)

Steve Erickson says:

August 11, 2011 at 1:15 pm

All right! Lets do the numbers:

3.0% (maximum proportion of coal that may escape in shipment according to now scrubbed BNSF website)

85.0% (maximum reduction that MAY be required)

=0.45% (minimum escape rate)

Washington: current proposed coal export facility capacity in million tons per year:

80 [Longview]

48 [Bellingham]

5 [Grays Harbor]

=113 million tons per year

=226,000,000,000 pounds per year

x 0.45% (minimum escape rate)
= 1,017,000,000 [with rounding] pounds per year lost during shipment

So, each year there may be somewhere in the neighborhood of over 1 billion pounds of coal escaping during shipment.

Next question: how long is the route? What is the average projected loss per mile of rail line? What is the average loss per mile along major and minor waterways (the Columbia, Puget Sound, etc.)?

[Reply](#)

Kim says:

August 12, 2011 at 12:40 am

Yes numbers! Thank you! Also, the fact that they tried to start building the unloading zone at cherry point without any permits also really makes you wonder what else they are trying to get done without anyone knowing. Transparency anyone? I don't trust them! They are going about this like the public will have no sway on whether or not the terminal will get built. They haven't brought anything to the table except for "We are going to build this terminal"

[Reply](#)

Jason Van Orsdol says:

October 31, 2011 at 7:30 am

Western Joint Line Route into major Hubs is appx 1,200 miles.

[Reply](#)

Kim says:

August 12, 2011 at 12:49 am

with 1 billion pounds of coal dust escaping with maybe half being into our already troubled Puget Sound, would they need a permit to discharge into our waterways? that's just alot of coal.... and lets not get started on the process of coal refinement- mercury, uranium, thorium, arsenic, and other heavy metals... hmmm health problems anyone?

[Reply](#)

Steve Erickson says:

August 12, 2011 at 10:50 am

No, they would not need, e.g., a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act because its not a point source emission. But this is precisely the sort of cumulative environmental impact that SEPA (State Environmental Policy Act) is intended to address. With this information. it looks to me that not only will people in the immediate vicinity of the projects be able to gain legal standing in any appeals, but also anyone whose travel will be disrupted (including both being forced to wait at crossings and anyone who uses passenger rail), but also anyone who can show a nexus to waterbodies that will likely be polluted.

About my rough calculations above: keep in mind that that is 1 billion pounds per year, every year. The sheer quantity of the coal being shipped is so huge that it looks to me like there is no realistic way to prevent significant adverse environmental impacts unless there is 100% containment during shipping. Even if emissions were reduced to 1/1000 of what they are now, that's still around 100,000,000 pounds per year, every year. And 100% containment should do very interesting things to shipping costs.

The escapement issue is also a very good organizing tool for communities along the way. Farmer, did the thousands of coal trains poison your crops and livestock? Your water supply? Lots of opportunity here for a big coalition.

[Reply](#)

Don S says:

August 12, 2011 at 11:18 am

Eric and Steve,

And lots of opportunity to needlessly create more fear. Actually, you need to do some more homework on BNSF's website as suggested by

don above. Coal dust is an issue only near the mines. BNSF testing shows that with load shaping and surface treatment that there is no detectable coal dust emitted after a train has traveled the first 120 or so miles of its journey.

With the coal currently being transported by BNSF to Canada for export (about 1-3 trains per day) there have been no air quality complaints to the Northwest WA clean air agency. I expect you'd find the same results in Seattle and back up the line.

This is a bogus issue for WA state communities.

[Reply](#)



Todd says:

August 14, 2011 at 7:56 am

Don's right on track here. The numbers being bandied about sound alarming, but there is no context for them, only assumptions. For example, the assumption that the coal dust is somehow distributed equally along the route, vice most of the loose particles escaping during the early part of the journey from the loading facility near the mine.

- Being alarmist like this actually WEAKENS any arguments against the Powder River Basin to Cherry Point plan, as it becomes yet another data point of shoddy analysis by the opposition.
- If you want to oppose this plan, say less, but say what is exactly correct.
- Also, I noticed that nobody is talking about the coal trains that have been traveling this same BNSF rail route for decades (albeit at far less frequency than proposed). Do we see even a mote of coal dust along the tracks in Edmonds or Everett? Nope.
- Let's be more factual in our discussion, by expressing concern for the coal dust IN WYOMING, because that's where it's going to be deposited.

[Reply](#)



Eric de Place says:

August 15, 2011 at 10:42 am

Don S and Todd,

I hope you're right! But it seems to me like the best way for NW communities to get certainty about this issue — an issue that many people are deeply concerned about — would be to expand the scope of the coal export terminal EIS projects to examine the potential risks of coal dust escape all along Washington's rail lines, including evaluating dust escape today in windy locations like the Columbia River Gorge and Chuckanut Drive.

If there's documented evidence that coal dust only escapes within a short distance of the PRB mines (and only from loaded cars) please share it with me. I would be more than happy to revise or clarify what I've written if there is, in fact, good evidence to show that railway coal dust is not problematic.

Steve Erickson says:

August 18, 2011 at 5:18 pm

Except that today its being reported that Puget Soundkeeper found coal traces along a rail line.

Why should the coal corporations and their allies (such as BNSF) get special treatment? If I drive my truck down the highway I'm supposed to keep the load covered so NOTHING escapes. The volume of coal that is proposed to be moved through Washington is so huge that there needs to be zero tolerance for any loss.

As for complaints to NW Clean Air Agency, we're not talking about plumes blowing off the trains. Just a slow steady loss that will continue until the mines are played out. Or the Chinese get off coal. Either way, the cumulative emissions are huge. As I calculated using BNSF's own figures, even if the current rate of loss in shipping is reduced as proposed, that's still over 1,000,000 pounds per year. Every year. Even if the Bellingham export facility is considered in isolation (which SEPA says you're not supposed to do), the emissions will be around 400,000,000 pounds per year.

[Reply](#)

Steve Erickson says:

August 22, 2011 at 12:40 pm

I see that I ave a typo in this line:

As I calculated using BNSF's own figures, even if the current rate of loss in shipping is reduced as proposed, that's still over 1,000,000 pounds per year.

I dropped three zeros. The number should be 1,000,000,000. That's 1 billion.

Paula says:

August 19, 2011 at 9:51 pm

My hometown, Seward Alaska, has the distinction of being the terminus for the Usibelli Coal trains. these trains haul coal from interior Alaska (Healy) to Seward to load onto ships via conveyor. Coal is headed to Chile and China. If a bit windy, they have to shut down the conveyor because it blankets Seward with coal dust. Oh well, not many people there, so not much complaining going on. Apparently it is CLOSER for Chile to import Alaska coal, than to source coal from Australia. Now the big planners are considering developing a large coal deposit across Cook Inlet..using a conveyor to get coal to tidewater. How about the salmon in the rivers that will be destroyed.

[Reply](#)

marilee dea says:

October 7, 2012 at 8:26 am

As a nurse practitioner and an urban organic farmer situated less than a 1/2 mile from the BNSF tracks, I have concerns and questions about what is in the coal dust besides asthma irritating, fine particle, coal. Is the mercury, arsenic, lead frequently mentioned with coal, found in the coal dust or is limited to extraction, refinement or burning phase of coal production and use?

[Reply](#)

Donald Steinke says:

February 15, 2013 at 5:51 pm

Eric,

Laura Stevens and I met with a long time rail worker who claims that most of the fugitive coal comes out the bottom of the trains. He said no one bothers to repair the seals. No one has mentioned that.

On the other hand, if that were true, then why would bnsf force shippers to apply surfactant?

You mentioned that the trains don't need an NPDES permit because they are not point sources of water pollution. It just so happens that one section of the Clean Water Act DOES regulate non-point sources, such as neighborhood storm drains.

Does anyone know who regulates the fugitive coal that sifts out the bottom of the rail cars onto the tracks and is then part of runoff into salmon-bearing streams?

[Reply](#)

pat says:

March 16, 2013 at 10:29 pm

hmm didn't know about the garbage making up the dust I have to go over to the tracks at the near the inlet here where a train load of coal passes by a small neighborhood park used by moms with their babies here in Anchorage Alaska. hmm 500 lb's a car think i'll walk over to the EPA and ask them for any reserch papers conserning coal dust lost. maybe thats why it doesn't matter which salmom you eat.. the amount of mercury between wild and farmed are about the same. I quit eating tuna and salmom hahaaha

[Reply](#)

Sightline Daily brought to you by Sightline Institute.

1402 Third Avenue, Suite 500 | Seattle, Washington 98101 | tel: +1.206.447.1880

APPENDIX 46

Point of No Return

The massive climate threats
we must avoid

January 2013

GREENPEACE

Contents

#1 Executive summary	4
#2 The world's biggest dirty energy projects	10
#3 Calculating the impact of the dirtiest energy projects	16
#4 Overshooting 2°C: A world we don't want	22
#5 Clean solutions for the power sector	26
#6 The vision of the Energy [R]evolution can achieve results	34
#7 Action!	36
Appendix	40
Endnotes	54

For more information contact:

pressdesk.int@greenpeace.org

Written by:

Ria Voorhar & Lauri Myllyvirta

Edited by:

Brian Blomme, Steve Erwood,
Xiaozhi Liu, Nina Schulz,
Stephanie Tunmore, James Turner

Acknowledgements:

Ben Ayliffe, Ricardo Bartelo,
Arif Fiyanto, Paul Johnston,
Harri Lammi, Kelly Mitchell,
Renata Nitta, Deng Ping,
Sun Qingwei, Keith Stewart,
Aslihan Tumer, Georgina Woods

Creative Design and Direction:

Sue Cowell / Atomo Design
www.atomodesign.nl

Cover photograph:

© Paul Langrock / Greenpeace

JN 437

Published in January 2013 by

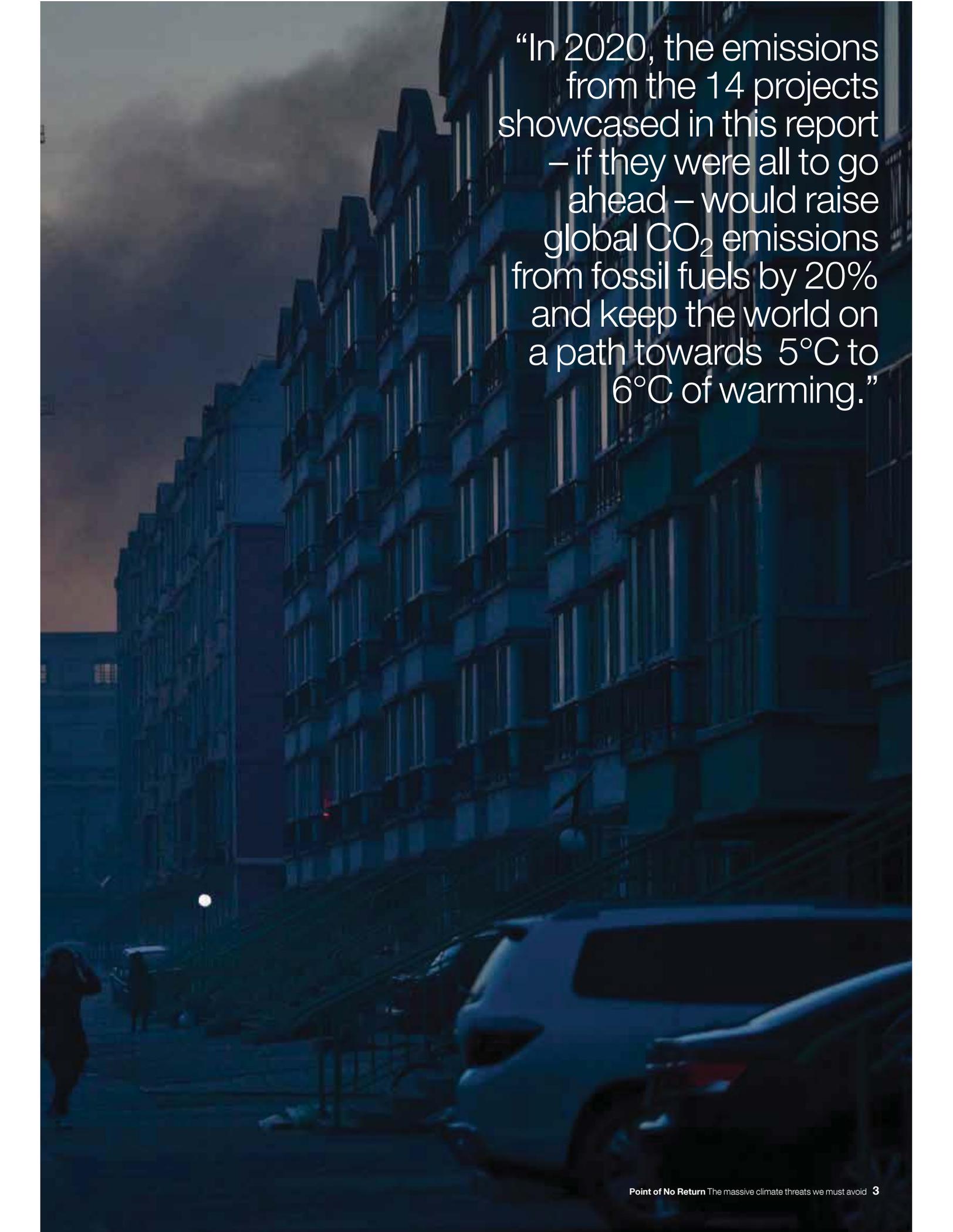
Greenpeace International

Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands

greenpeace.org



Image Smoke from factories causes severe air pollution in Huolin Gol city, Inner Mongolia, whose economy relies heavily on coal-related industries.

A photograph of a tall apartment building at dusk, with a car and a person in the foreground. The scene is dimly lit, with a blue and purple color palette. The building has many windows and balconies. A car is parked in the foreground, and a person is walking on the sidewalk. The sky is dark with some clouds.

“In 2020, the emissions from the 14 projects showcased in this report – if they were all to go ahead – would raise global CO₂ emissions from fossil fuels by 20% and keep the world on a path towards 5°C to 6°C of warming.”

Image Traffic moves through billowing smoke and lingering, passing by oil refineries in Alberta, Canada.



#1

Executive summary

The world is quickly reaching a **Point of No Return** for preventing the worst impacts of climate change. Continuing on the current course will make it difficult, if not impossible, to prevent the widespread and catastrophic impacts of climate change. The costs will be substantial: billions spent to deal with the destruction of extreme weather events, untold human suffering, and the deaths of tens of millions from the impacts by as soon as 2030¹.

With total disregard for this unfolding global disaster, the fossil fuel industry is planning 14 massive coal, oil and gas projects that would produce as much new carbon dioxide (CO₂) emissions in 2020 as the entire US², and delay action on climate change for more than a decade. The 14 massive projects discussed in this report would add a total of 300 billion tonnes of CO₂ equivalent (Gt CO₂ e) of new emissions to the atmosphere by 2050 from the extraction, production and burning of 49,600 million tonnes of coal, 29,400 billion cubic metres of natural gas and 260,000 million barrels of oil. This represents an enormous increase in new fossil fuels, and an enormous increase in the impact on the global atmosphere. The research for this new report was carried out by Ecofys, a consulting company expert in sustainable energy solutions and climate policies.

Burning the coal, oil and gas from these 14 projects would significantly push emissions over what climate scientists have identified as the “carbon budget”, the amount of additional CO₂ that must not be exceeded if we are to keep climate change from spiralling out of control. The crucial period is the time until 2020.

In 2020, the emissions from the 14 projects showcased in this report – if they all were to go ahead – would raise global CO₂ emissions from fossil fuels by 20% and keep the world on a path towards 5°C to 6°C of warming. To avoid the worst impacts of climate change, the rise in global temperatures needs to be limited to below 2°C. Therefore, the addition of CO₂ of this magnitude in the next few years would push the climate beyond the point of no return, locking the world into a scenario leading to catastrophic climate change, and ensuring that we run out of time.

Emissions are already out of control. According to the International Energy Agency (IEA) global CO₂ emissions increased by 5% in 2010 for the largest recorded absolute increase, and went on to grow by over 3% in 2011, exceeding worst-case projections that would lead to 5°C to 6°C of long-term warming³. To avoid locking us into catastrophic warming, the building of new fossil fuel infrastructure needs to stop within five years⁴ – placing the planned dirty energy projects in direct conflict with a livable climate.

The 14 dirty energy projects in this report range from massive expansion of coal mining in China, to large-scale expansion of coal exports from Australia, the US and Indonesia, to the development of risky unconventional sources of oil in the tar sands of Canada, in the Arctic, in the ocean off the coast of Brazil, in Iraq, in the Gulf of Mexico and in Kazakhstan, and to gas production in Africa and the Caspian Sea. They are the biggest dirty energy projects planned in the coming decades.⁵

For more than two decades, climate scientists have warned that, unless heat-trapping emissions are reduced significantly, severe consequences from climate change will follow.⁶ Avoiding the worst impacts means limiting the rise in global temperatures to below 2°C – in itself an extremely rapid change compared with the Earth's past. In November 2012, both the International Energy Agency (IEA) and the World Bank cautioned that the world is heading to a temperature increase of between 3.6°C and 4°C.⁷ With the additional CO₂ from these 14 projects, the average global temperature will more likely exceed 4°C and quite possibly 6°C – the worst scenarios identified by climate scientists.

Yet, a handful of governments and a small number of companies in the fossil fuel industry are pushing these projects, apparently without a care about the climate consequences. In November 2012, the IEA said in its annual World Energy Outlook that no more than one-third of the carbon contained in the proven reserves of fossil fuels can be released into the atmosphere by 2050 if the world is to achieve the 2°C goal.⁸ The development of these new coal, oil and gas projects would come at a time when climate scientists are increasingly linking alarming extreme weather events to climate change.⁹ These extreme weather events include Hurricane Sandy in October 2012¹⁰, droughts in the US in 2012¹¹ and 2011¹², heat waves and forest fires in Russia in 2010¹³, and the European heat wave in 2003 that killed tens of thousands¹⁴. The disasters the world is experiencing now are happening at a time when the average global temperature has increased by 0.8°C¹⁵, and they are just a taste of our future if greenhouse gas emissions continue to balloon.

The impact on people if we trigger catastrophic climate change will be terrible. In September 2012, a new report, commissioned by 20 governments, gave an insight into the disaster that is coming. It estimated that climate change is already taking 5 million lives a year. By 2030, deaths could total 100 million.¹⁶

Ecofys' research identifies pathways to climate disaster and pathways to avoid climate chaos.

The most attractive avoidance pathway identified by Ecofys shows there is still a 75% chance of keeping the increase in the average global temperature below 2°C if actions are taken now to reduce emissions. This would not be easy, but it is possible. One of the key actions is to avoid the massive new emissions from the 14 projects in this report. It would also require governments to do what they have promised and reduce global emissions. The Ecofys 75% pathway requires ensuring emissions peak by 2015 and then drop by 5% annually.¹⁷ The new CO₂ emissions avoided by cancelling these dirty energy projects would cover about one third of the total reductions needed to head off catastrophic climate change.¹⁸

The huge gap between what governments say they are doing to prevent catastrophic climate change and what they are actually doing is most evident with these 14 projects. The governments that have approved them have all agreed that the global average temperature must be kept below 2°C.

If the governments supporting the projects in this report help push the world past the point of no return, the great irony will be that the resulting climate chaos was preventable. The technology for avoiding the emissions from these projects and for reducing overall global emissions exists right now.

Clean and safe renewable energy, coupled with a much-increased implementation of energy efficiency, can provide the power needed to run the planet and avoid the risks of pushing us ever closer to catastrophic climate change. That is abundantly clear from the astounding progress in the development of renewable energy over the past decade.

In 2011, renewable energy provided over 30% of new electricity production globally, up from less than 5% in 2005.¹⁹ This explosive growth can continue and is by far the best hope for avoiding the most serious impacts of climate change.

The global renewable-energy scenario developed by Greenpeace – the Energy [R]evolution – shows how to deliver the power and mobility the dirty projects are promising, without the emissions and the destruction; not only faster, but also at a lower cost.²⁰ The scenario indicates that by 2035 renewable energy must increase to 65% of electricity production, and energy efficiency must increase to reduce the impact the world is already seeing from climate change and to avoid the catastrophe of a global average temperature increase of 4°C to 6°C. The world cannot afford to allow the major new coal projects detailed in this report to go ahead and lock in decades of dirty electricity production, or to allow the oil projects to delay the shift to more sustainable transport systems.

The Greenpeace scenario shows that by 2020 renewable energy could deliver twice as much power as the combined output of the four coal projects highlighted in this report.²¹ More efficient cars, plus a switch to cleaner fuels and a much smarter use of energy in power generation, buildings and industry, could save more oil than the seven massive oil projects featured in this report could produce.²² There would be no need to exploit the oil and gas in the fragile Arctic if the world adopted a clean energy future.

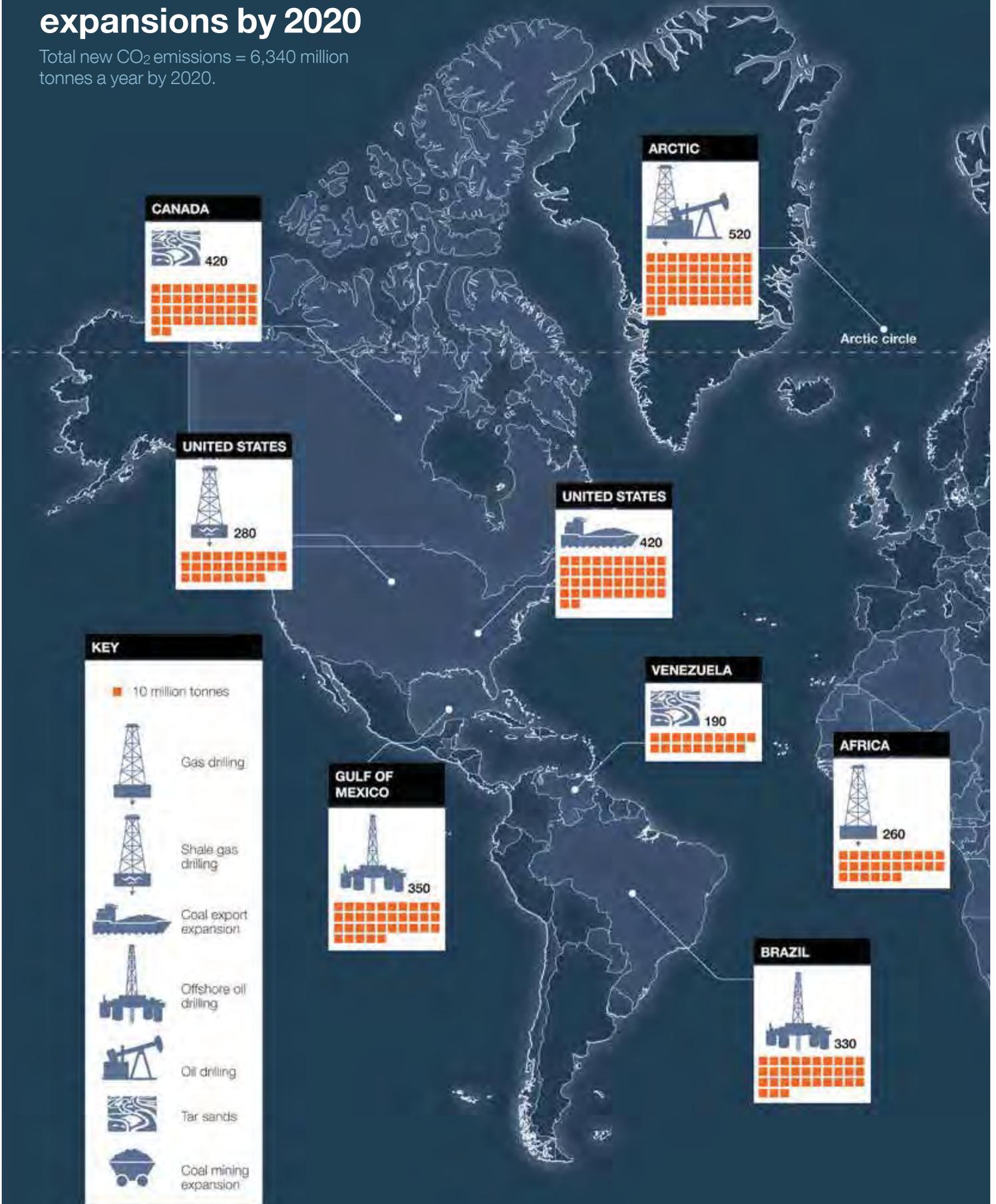
The clean energy future made possible by the dramatic development of renewable energy will only become a reality if governments rein in investments in dirty fossil fuels and support renewable energy.

The world is clearly at a **Point of No Return**: either replace coal, oil and gas with renewable energy, or face a future turned upside down by climate change.

“A handful of governments and a small number of companies in the fossil fuel industry are pushing these projects, apparently without a care about the climate consequences.”

Largest dirty energy expansions by 2020

Total new CO₂ emissions = 6,340 million tonnes a year by 2020.



Source: Ecobys



Image Aerial view of Syncrude's Aurora tar sands mine, in the Boreal forest north of Fort McMurray, Alberta, Canada.



#2

The world's biggest dirty energy projects

The world continues to burn coal, oil and gas at alarming rates. The appetite for burning these dangerous fossil fuels increases, despite years of warnings from climate scientists that continued burning and high levels of carbon dioxide emissions will cause catastrophic climate change.

In 2009, the world leaders attending the UN climate conference in Copenhagen agreed that emissions must be reduced, and promised the world they would take action.²³ In 2010 and 2011, the immediate years after the conference, CO₂ emissions grew twice as fast²⁴ as the worst-case projections leading to 6°C warming. The world is rapidly nearing the point of no return for preventing the climate chaos that will affect us all, and cause untold human suffering.

This report examines the impact that 14 massive coal, oil and gas extraction projects would have on climate change if they were to be implemented. Together, the emissions from burning the coal, oil and gas from these extraction projects would add an enormous 300 billion tonnes of CO₂ equivalent (GtCO₂e) emissions to the atmosphere by 2050. Of immediate concern is the impact these projects would have up until 2020, the period when significant reductions must happen to avoid the point of no return.

These projects would add 6.34 gigatonnes (Gt)²⁵ of new emissions to the atmosphere in 2020, more new CO₂ emissions than the total emissions produced annually by the US.²⁶ The result would be a 20% increase in global emissions at a time when there is an urgent need for emissions to start decreasing.

In 2011, when the IEA announced the record high global emissions of 31.2Gt, it projected that emissions will grow “to 37.0Gt in 2035, pointing to a long-term average temperature increase of 3.6°C,²⁷ even assuming that emission reduction and clean energy ambitions announced to date are fully implemented. In November 2012, both the IEA and the World Bank released reports indicating that the world is clearly heading for climate catastrophe.²⁸

In its news release, the World Bank put the threat of climate change succinctly: “The world is barreling down a path to heat up by 4°C at the end of the century if the global community fails to act on climate change, triggering a cascade of cataclysmic changes that include extreme heat-waves, declining global food stocks and a sea-level rise affecting hundreds of millions of people, according to a new scientific report released today that was commissioned by the World Bank.”²⁹

The additional 6Gt of emissions from these 14 projects makes the scenarios of the IEA and the World Bank that are leading to catastrophic climate change look even worse.

The significant increase that would result from adding the emissions of the 14 projects would lock the world onto a path to an average global temperature increase of more than 2°C. As the IEA has suggested, it is more than likely that these new emissions will cause the global average temperature to soar to 4°C and quite possibly to 6°C of global warming. These projects have the potential to ensure the world is irretrievably on course to suffer extreme weather events, increased conflict, reduced availability of food and water, and potentially catastrophic disruption.

Climate scientists have identified a “carbon budget,” an amount of additional CO₂ that must not be exceeded to keep global warming from overshooting dangerous limits. In November 2012, the IEA said in its annual World Energy Outlook that no more than one-third of the carbon contained in the proven reserves of fossil fuels can be released into the atmosphere by 2050 if the world is to achieve the 2°C goal.³⁰ The 14 projects alone would eat up 30% of the carbon budget by 2050, and would ensure total emissions exceed the limits.

The world is heading towards climate chaos because a handful of governments and a small number of companies in the fossil fuel industry are pushing these 14 projects, apparently without any regard for the climate consequences. In the case of the governments, their actions are also without regard for their promises to curb emissions.

Climate change is arguably the gravest environmental challenge facing the world now. Unchecked, climate change will cause significant human suffering and economic problems. The climate is now being altered by the CO₂ emissions that have been pumped into our atmosphere for more than a century.

Climate scientists are largely in agreement that climate change, caused by our burning of coal, oil and gas, is already having severe consequences. These consequences are coming at a time when the increase in the global average temperature is about 0.8°C, well below the level of 2°C that international climate scientists agree the world must stay under in order to avoid the worst impacts of climate change.

The investment needed for these 14 projects would bring additional coal, oil and gas to market and, as a result, would lock in outdated sources of energy for decades. These projects would undermine the spectacular development of renewable energy around the world over the last few years. They would also wreak havoc on some of the most iconic ecosystems in the world, including the Great Barrier Reef, the Arctic, the Yellow River of China, the Great Bear Rainforest on the west coast of Canada, and the tropical rainforests of Indonesia.

A sign of the world’s addiction to fossil fuels is that, even in the face of the clear option to reduce emissions provided by the rise in the impact of renewables, the fossil fuel industry is going after some of the most difficult and dangerous fossil fuels ever to be extracted. Techniques proposed to exploit dirty fuels in the Arctic and off the Brazilian coast have already caused significant accidents³¹, such as the disastrous *Deepwater Horizon* spill in the Gulf of Mexico in 2010.

The 14 massive coal, oil and gas extraction projects covered in this report are the worst of the worst. These projects would have the largest emissions of any projects on Earth today and would cause the largest increases in greenhouse gas emissions;³²

Australia: by 2025, coal exports would increase to 408 million tonnes a year above 2011 levels, pushing associated CO₂ emissions up by 1,200 million tonnes a year once the coal is burned. By then, the CO₂ emissions caused by Australian coal exports would be three times as large as the emissions from Australia’s entire domestic energy use.³³

China: China’s five northwestern provinces plan to increase coal production by 620 million tonnes by 2015, generating an additional 1,400 million tonnes of CO₂ a year, almost equal to Russia’s emissions in 2010.

The US: plans to export an additional 190 million tonnes of coal a year, mainly through the Pacific Northwest. This would add 420 million tonnes of CO₂ a year to global emissions before 2020; more than the entire CO₂ emissions from fossil fuels in Brazil in 2010.

Indonesia: plans a massive expansion in coal exports from the island of Kalimantan which would add 460 million tonnes of CO₂ a year by 2020, creating dire environmental impacts for the local people and the tropical forests.

Canada: production of oil from the tar sands in Alberta will triple from 1.5 to 4.5 million barrels a day by 2035, adding 706 million tonnes of CO₂ to global emissions a year. By 2020, the tar sands expansion would add annual emissions of 420 million tonnes of CO₂, equal to those of Saudi Arabia.

The Arctic: Oil companies plan to take advantage of melting sea ice in the environmentally sensitive Arctic region to produce up to 8 million barrels a day of oil and gas. If the plan were to succeed, despite mounting technical obstacles and enormous environmental risks, the drilling would add 520 million tonnes of CO₂ a year to global emissions by 2020, as much as the entire national emissions of Canada, and 1,200 million tonnes by 2030.

Brazil: companies intend to extract up to 4 million barrels of oil a day from underneath the Brazilian ocean³⁴, adding 660 million tonnes of CO₂ to annual global emissions by 2035.

Gulf of Mexico: plans for new deepwater oil drilling would produce 2.1 million barrels of oil a day in 2016, adding 350 million tonnes of CO₂ emissions, equivalent to the emissions of France in 2010.

Venezuela: the Orinoco tar sands will produce 2.3 million barrels of new oil a day by 2035, adding 190 million tonnes of CO₂ in 2020.

The US: new production will deliver 310 billion cubic metres a year of shale gas in 2035, adding 280 million tonnes of CO₂ by 2020.

Kazakhstan: new production in the Caspian Sea will deliver 2.5 million barrels of oil a day by 2025, adding 290 million tonnes of CO₂ in 2020.

Turkmenistan, Azerbaijan and Kazakhstan: new production in the Caspian Sea will deliver 100 billion cubic metres of natural gas by 2020, adding 240 million tonnes of CO₂ emissions

Africa: new production will provide 64 billion cubic metres of natural gas by 2015 and 250 billion cubic metres to 2035, adding 260 million tonnes of CO₂ in 2020

Iraq: new production will deliver 1.9 million barrels of oil a day by 2016 and 4.9 million barrels a day by 2035, adding 420 million tonnes of CO₂ in 2020

A full discussion of selected projects appears in the Appendix to this report, detailing the anticipated production levels and CO₂ emissions, and outlining the significant environmental harm these projects will cause.

These projects are being pushed ahead because the world has not curbed its demand for fossil fuels. The dirty coal-mining projects are driven by the construction of new coal-fired power plants around the world, most importantly in China, India, the EU and Russia, followed by the US, Vietnam, Turkey and South Africa. A report by the World Resources Institute in November 2012 showed that countries are planning to build 1,200 new coal-fired electricity plants, a looming disaster for the climate.³⁵

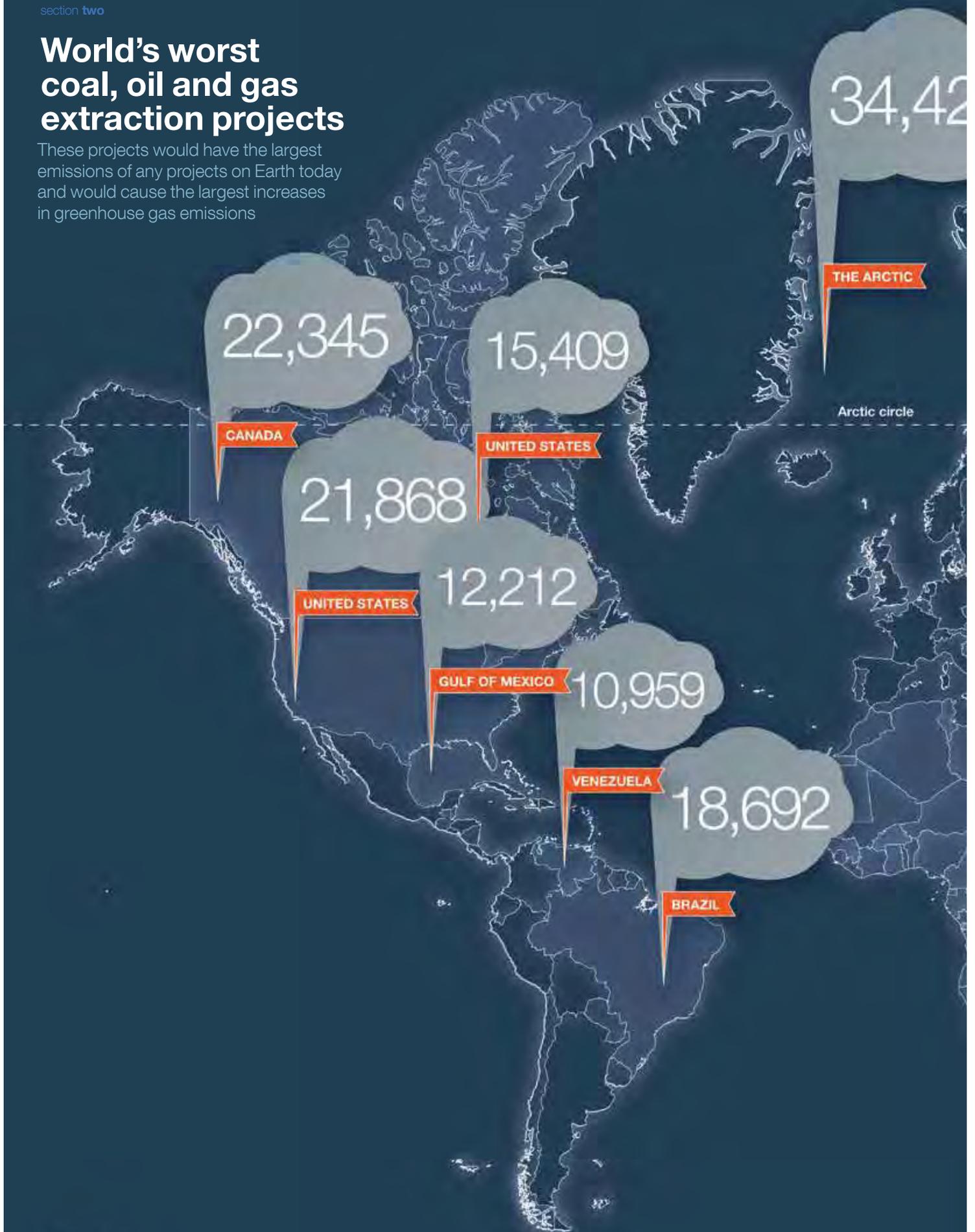
The EU, which has positioned itself as a leader on combating climate change, is also part of the problem of increasing emissions. Its coal consumption and associated CO₂ emissions have grown significantly in the past two years, while its political will to tackle climate change has waned.³⁶

While most EU countries don't have plans to extend their reliance on coal, Poland, Germany, Italy, Romania, the Netherlands, the Czech Republic, Bulgaria, Greece, and Slovenia are still allowing the construction of new dirty power stations. As the world's second largest coal importer and oil consumer, the EU must do more to curb its emissions.

The EU needs to regain its leadership in tackling climate change by playing a major role in preventing these massive dirty energy projects from going ahead.³⁷ The EU has been the historic leader in the roll-out of renewable energy, more fuel-efficient cars and other key clean energy solutions, and it urgently needs to show leadership again in phasing out dirty fuels.

World's worst coal, oil and gas extraction projects

These projects would have the largest emissions of any projects on Earth today and would cause the largest increases in greenhouse gas emissions



Source: Ecolys



Image Maryellen McConnell uses a respirator in and around her Washington County home several days each week because of methane poisoning. She has passed out many times and gone into the hospital. Her farm is on top of an area where gas companies are storing waste materials from hydraulic fracturing drilling in deep underground shale formations.



#3

Calculating the impact of the dirtiest energy projects

The supporting research for this report into the impact of the 14 enormous coal, oil and shale gas extraction projects was carried out by Ecofys, a consulting company well known for its expertise in analysing climate policies and sustainable energy solutions to climate change.

A much-simplified discussion of the Ecofys analysis shows that business-as-usual, including the emissions from the 14 projects, would see cumulative CO₂ emissions of 2,340Gt of CO₂ equivalent (Gt CO₂e) from 2011 to 2050.³⁸ This is a clear scenario for climate disaster, consistent with a 5-6°C increase in average global temperature.³⁹

Current, but woefully inadequate, measures to reduce emissions might cut the global temperature rise to approximately 4°C,⁴⁰ still a “devastating” outcome according to the World Bank.

A carbon budget developed by Ecofys identifies a scenario that shows there is still a 75% chance of keeping the global average temperature increase below 2°C. To stay within this carbon budget, cumulative emissions between 2010 and 2050 cannot exceed 1,050Gt CO₂e, and global emissions need to start decreasing at the very latest by 2016.

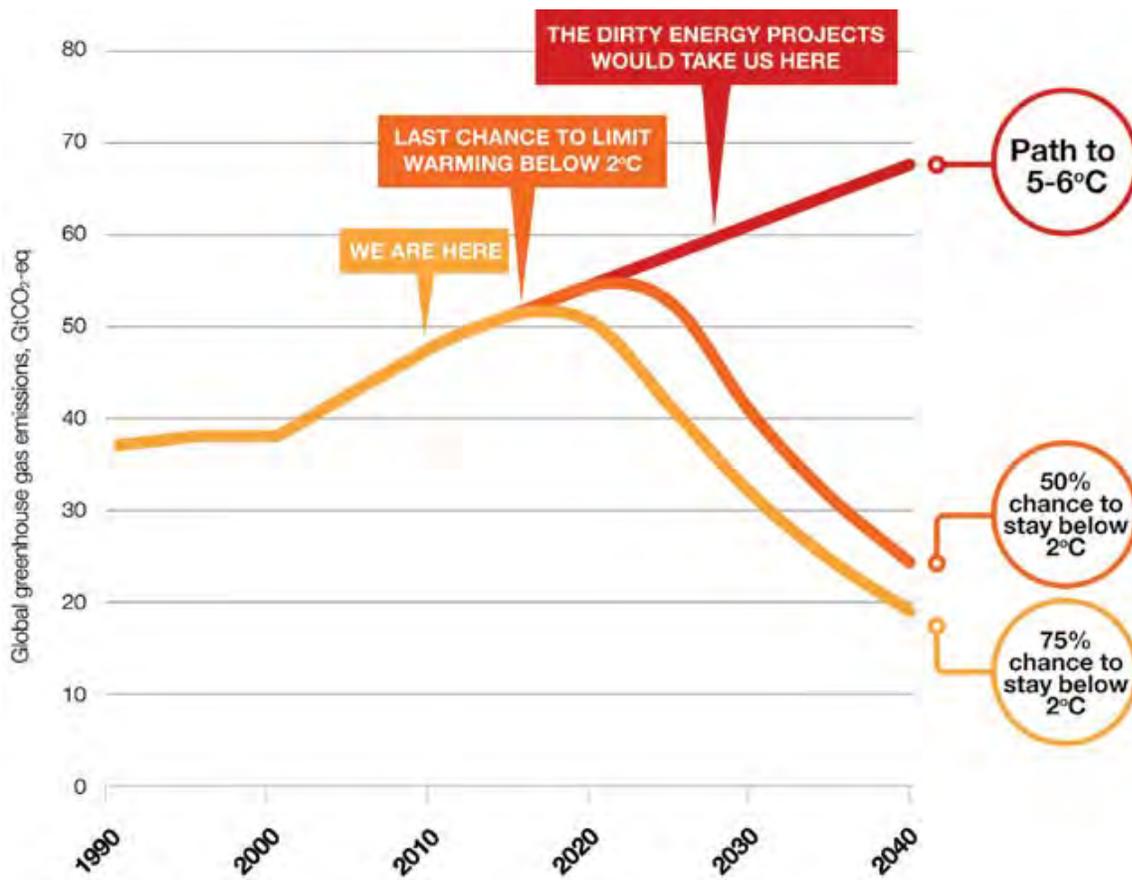
The problem is that investment in energy infrastructure for fossil fuels locks the world into using coal, oil and gas for decades. The IEA estimates that 590Gt CO₂ is already locked in by existing fossil fuel-dependent infrastructure, and building new coal, oil and gas based infrastructure must stop by 2017 to avoid locking in more emissions than can be emitted without overshooting 2°C warming. After that, the only way to stay below 2°C warming is to shut down the many new coal, oil and gas power plants and the new coal mines and oil operations that could be operating, making the task of meeting the target hugely expensive and politically difficult.⁴¹ The 14 energy projects would ensure that the dirty energy investments continue well beyond that point of no return.

The growth in fossil fuel consumption driven by the 14 massive projects alone would eat up the remaining carbon budget, when existing lock-in is taken into account: Ecofys calculates the cumulative emissions to 2050 from the 14 projects at 300Gt CO₂e. Put differently, replacing the dirty projects with safe and clean energy would provide almost one third of the reduction needed to have a 75% chance of avoiding climate chaos.

This 75% chance is still available, even though global carbon emissions reached the record highs the IEA calculated in 2010 and 2011, and even though emissions have been growing faster in the last two years than in even the most pessimistic scenarios envisaged by the IEA and the Intergovernmental Panel on Climate Change (IPCC).⁴²

Passing the point of no return

The fossil projects that would cause lock-in to over 2°C warming



The key to avoiding climate chaos is to act immediately to reduce emissions in this decade. Climate scientists calculate that the carbon that has already accumulated in the atmosphere will likely increase the average temperature by another 0.8°C. Therefore, the room to manoeuvre to reduce emissions is getting smaller all the time, given the continued ineffective action of governments.

The IEA has said more than once that there is little room for manoeuvre. In November 2012, when it released its annual World Energy Outlook, IEA chief economist Fatih Birol said: “The chances are slimmer and slimmer of avoiding a 2°C rise.”⁴³ The IEA also said that CO₂ emissions related to energy production are expected to increase from “an estimated 31.2Gt in 2011 to 37.0Gt in 2035, pointing to a long-term average temperature increase of 3.6°C.”⁴⁴

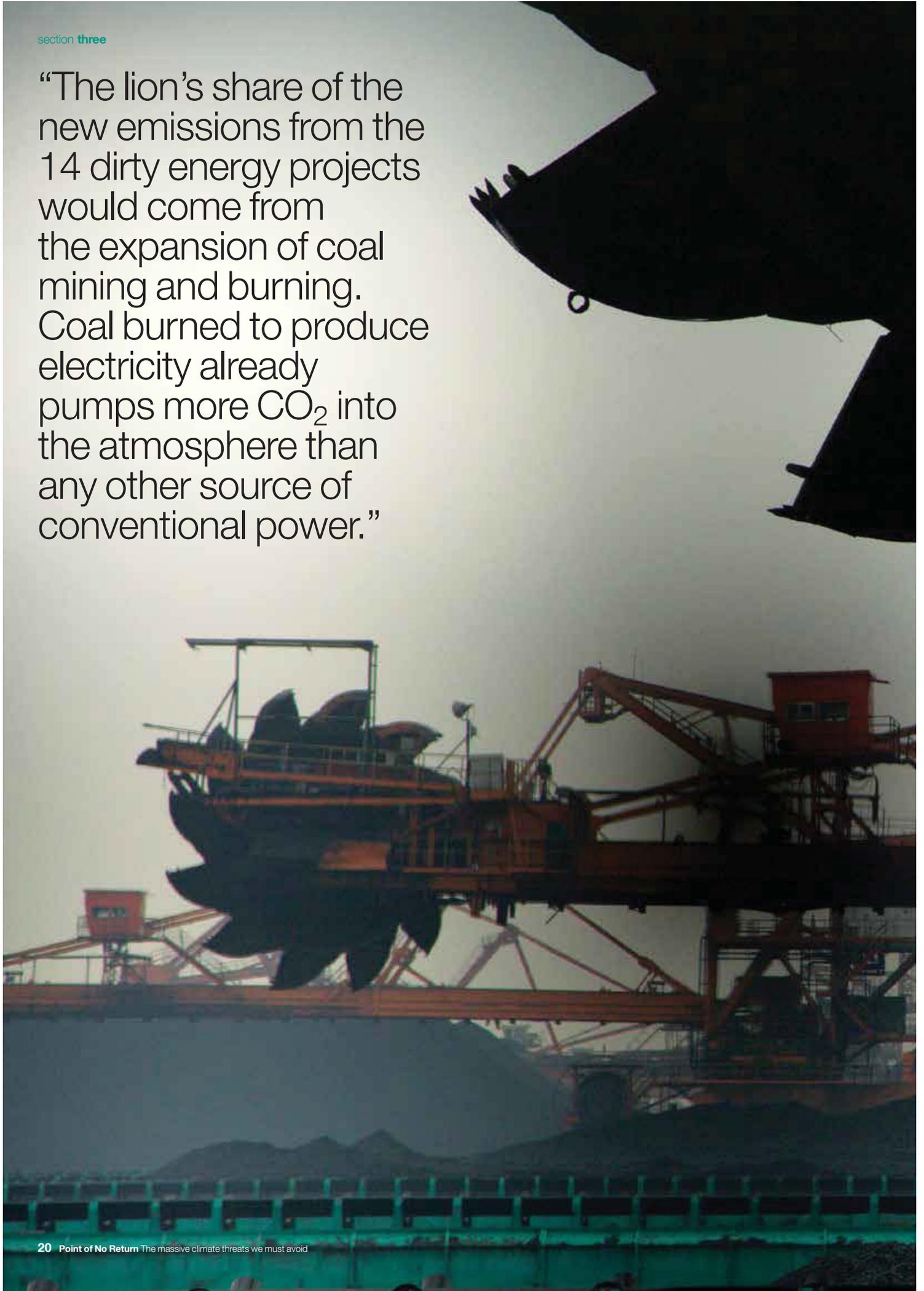
The 75% scenario developed by Ecofys shows that emissions must peak in 2015 and then decline by 5% a year to get cumulative emissions down to 1,500Gt, the combination of historic emissions of 450Gt CO₂e and the Ecofys carbon budget of 1,050. That of course means not adding the 300Gt of new emissions the 14 projects would create by 2050.

The world should be – but is clearly not – on a path to lower emissions already. Almost 200 nations agreed in 2010 to limit the global average temperature rise to below 2°C, to avoid the most devastating impacts from climate change.⁴⁵ The new coal, oil and gas projects featured in this report will make cutting emissions even more difficult.

The lion's share of the new emissions from the 14 dirty energy projects would come from the expansion of coal mining and burning. Coal burned to produce electricity already pumps more CO₂ into the atmosphere than any other source of conventional power. Coal-fired power plants are responsible for three-quarters of “locked in” emissions in the power sector.⁴⁶ By 2020, the dirty projects would extract an additional 1,400 million tonnes of coal, enough to fuel 550 large coal-fired power stations.⁴⁷ The growth in coal use is the sole reason CO₂ emissions grew at record rates over the past two years.⁴⁸ Coal burning also produces pollutants and toxic emissions that cause hundreds of thousands of deaths a year.⁴⁹

The other major source of new emissions from the 14 projects would be oil. The world already consumes 77 million barrels of oil a day (mbd), 54% of which is used by transport.⁵⁰ The new oil projects in this report would add an additional 13.6mbd of oil production by 2020, with annual CO₂ emissions by then of 2,200 million tonnes.⁵¹ This would be equivalent to putting an extra 500 million cars on the road⁵², an additional dose in the prescription for disaster we have now.

“The lion’s share of the new emissions from the 14 dirty energy projects would come from the expansion of coal mining and burning. Coal burned to produce electricity already pumps more CO₂ into the atmosphere than any other source of conventional power.”



The methodology of the Ecofys report

The methodology Ecofys used for its analysis included:

- developing fuel production information for the project inventory based on government sources, corporate sources, including Petrobrás, the state-owned Brazilian fossil fuel company, and the consulting firm Wood MacKenzie, and on publications from the IEA, the US Geological Survey and Geoscience Australia;
- estimating the expected fuel production from the 14 sources to 2050;
- using CO₂ emission factors from the IPCC, and energy conversion factors from the National Institute of Standards and Technology, the IEA and the American Physical Society, to calculate the annual emissions from the 14 projects and their total emissions from 2012 to 2050; and
- estimating the CO₂ emissions associated with the production (as opposed to combustion) of the dirty fuels. For most of the projects, these emissions were estimated at 15% of combustion emissions, while for the tar sands, conventional gas and shale gas emission factors from literature were used.

Ecofys considered:

- all tar sands production in Alberta, Canada, and in the Orinoco region of Venezuela, to be additional to current production because it is unconventional;
- all oil and gas that may be produced in the Arctic, all oil from off shore Brazil and all oil from the Gulf of Mexico as additional;
- coal from production expansion in China, Australia, Indonesia, and the northwest US as additional;
- oil and natural gas from the Caspian Sea as additional because both are to grow strongly over the next few decades; and
- gas from Africa and oil from Iraq as additional because both are expected to grow substantially.

Image Volunteers distribute donated food and supplies at a makeshift base to help residents of Queens, New York City, still without power after Hurricane Sandy.



#4

Overshooting 2°C: A world we don't want

New evidence is emerging of just how deadly and expensive overshooting 2°C could be for the planet. The impacts from the current level of warming are already severe enough to frequently cause great human tragedy.

The massive storm named Hurricane Sandy, which hit the eastern coast of the US in October 2012, is one consequence of climate change. Approximately 200 people died in the US and in the Caribbean, where Sandy also struck.⁵³ Millions of people were affected. 300,000 houses were destroyed in New York State alone,⁵⁴ businesses and jobs were disrupted, and electricity was cut for days. The states of New York and New Jersey alone expect the costs of Sandy to total \$62bn US dollars.⁵⁵

In addition, scientists now agree that recent catastrophic weather events – such as the heat waves in Europe in 2003 that killed 70,000⁵⁶ and the droughts in the US state of Texas in 2011 that caused \$5bn in damage – are a consequence of human-induced climate change.⁵⁷ The 2012 US drought resulted in a significant reduction in the corn crop, which will cause food prices to rise⁵⁸ – an increasingly common consequence of climate change. Extreme weather events will only become more frequent and more severe as temperatures continue to rise.⁵⁹

With the average global temperature already about 0.8°C above pre-industrial times, a report by the humanitarian organisation DARA has calculated that 5 million deaths a year are now caused by air pollution, hunger and disease, as a result of climate change and carbon-based economies.⁶⁰ This in a world where the temperature increase has not hit even 1°C, let alone 2°C or more.

The world's poorest nations are the most vulnerable, facing increased risk of drought, water shortages, crop failure, poverty and disease. The DARA report estimates that current climate impacts cost the world \$80bn in 2010, when climate-induced natural disasters, labour productivity losses, health impacts, and losses to industries such as agriculture, are considered.⁶¹

Bangladesh's Prime Minister Sheikh Hasina said: "One degree Celsius rise in temperature is associated with 10% productivity loss in farming. For us, it means losing about 4 million metric tonnes of food grain, amounting to about \$2.5bn, that is about 2% of our GDP."⁶²

Spikes in food prices will get worse and more frequent as extreme weather events caused by climate change devastate food production.⁶³ Droughts in the US Midwest and Russia in 2012 helped to push prices for maize and soyabeans to record highs.⁶⁴ The UN's food agencies have urged world leaders to take swift action to ensure that food-price shocks do not turn into a catastrophe that could hurt tens of millions of people.⁶⁵ The agencies said the 2007/08 price spike contributed to an 8% rise in the number of undernourished people in Africa.⁶⁶

If the 2°C target is surpassed, the impacts already being experienced will be much worse, and some new impacts will occur. A large-scale rise in sea levels is likely to be triggered somewhere between a 1.8°C and 2.8°C increase. This would threaten the existence of lower-lying islands. Beyond 3.5°C, the sea-level rise would be up to two metres, a height that would threaten many more coastal villages, towns, and cities. Most corals will bleach, and widespread coral mortality is expected if the temperature rise goes to 3°C above the temperatures recorded in the late 19th century. Up to 30% of global species will be at risk of extinction, and the figure could exceed 40% if the increase surpasses 4°C.⁶⁷

Warming of over 4°C would be catastrophic, as various tipping points are expected to be triggered at this level. For example, if the Amazon dries, it will release further CO₂.⁶⁸ Rising Arctic temperatures will also lead to CO₂ and methane being released through the permafrost thawing, with the potential to eat up more than 10% of the remaining carbon budget.⁶⁹ Climate change would most likely become impossible to stop, and large parts of the planet would become uninhabitable.

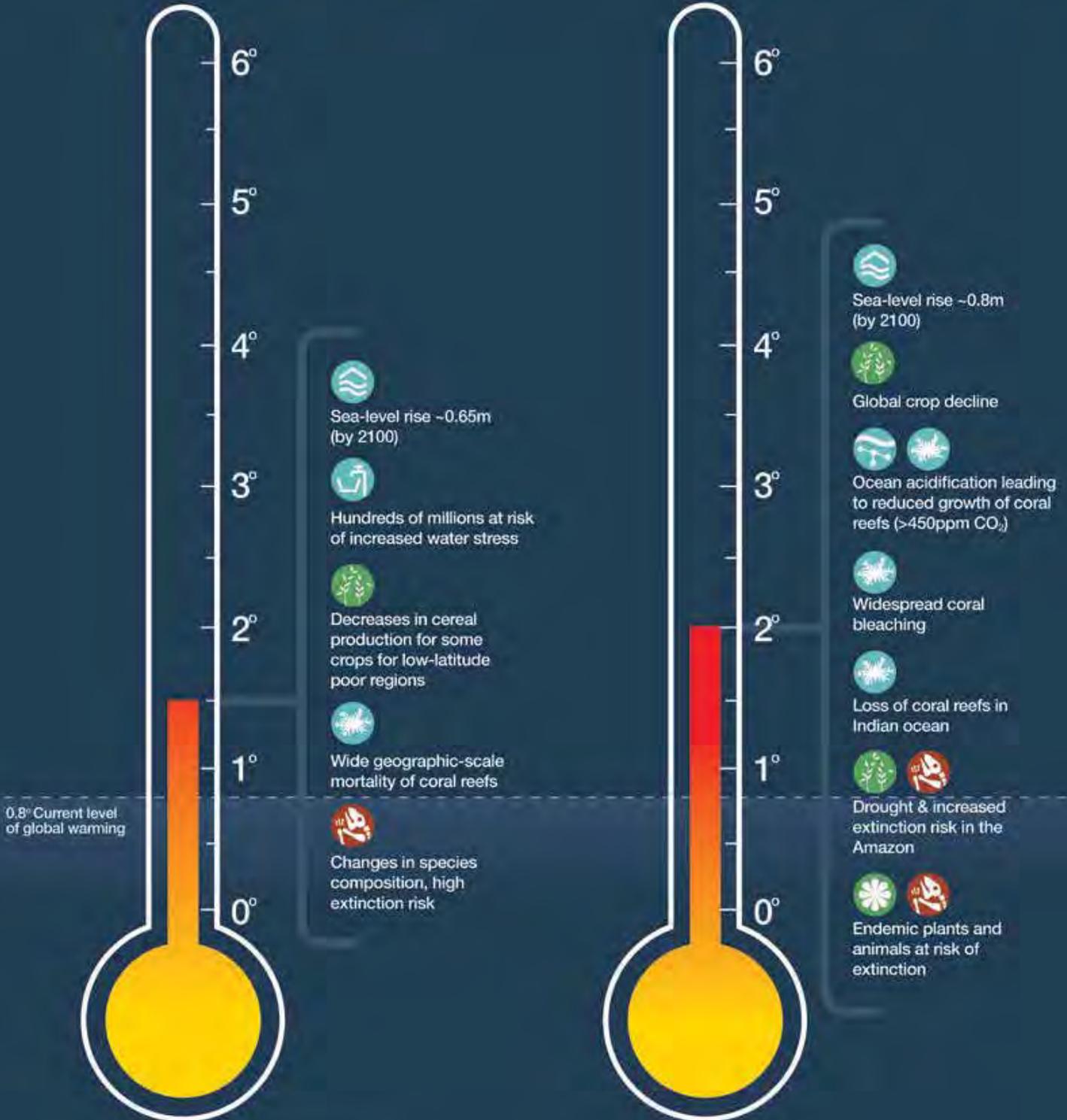
These potential impacts from failing to act on climate change show just how important it is to step back from the point of no return.

Climate change impacts

The impacts of various levels of global warming

1.5°C Warming above pre-industrial

2°C Warming above pre-industrial



Source: Ecodys, Climate Analytics & Potsdam Institute for Climate Impact Research 2011: A snapshot of a warming world. <http://climateactiontracker.org/assets/CAT-Infographic-20111211.pdf>

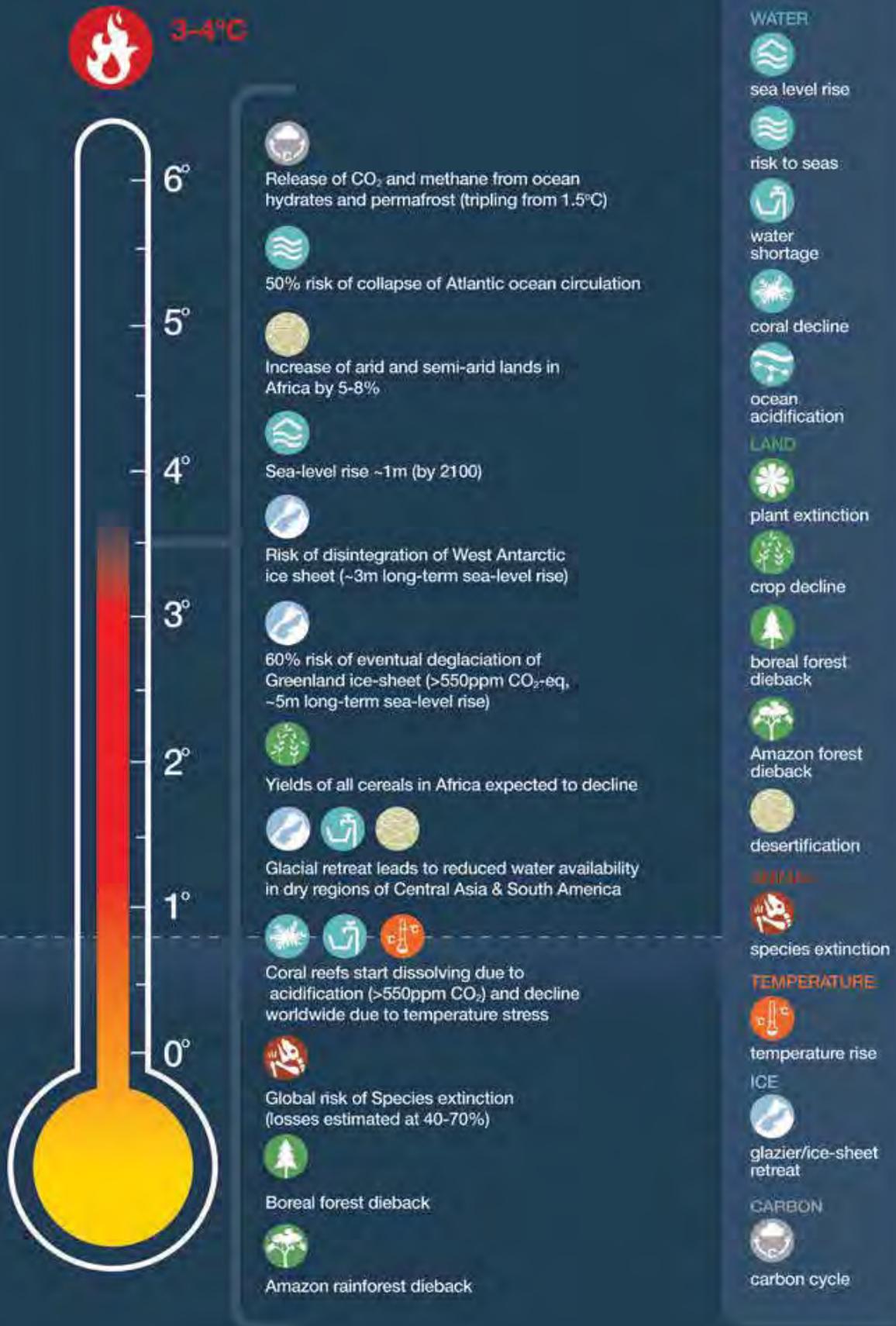


Image Wind Farm Forest Creek in Big Spring, Texas, producing 2.3MW with wind turbines made by Siemens.



#5

Clean solutions for the power sector

Environment and communities do not need to be put at risk for the sake of extracting more coal to produce electricity. Governments have a choice. They could continue to support the planned expansion of the US, Australian, Indonesian and Chinese coal operations, which would pump an additional 3 billion tonnes of carbon pollution into the atmosphere every year, leading to untold environmental consequences.⁷⁰ Or, governments could turn away from using coal for electricity production and champion renewable energy.

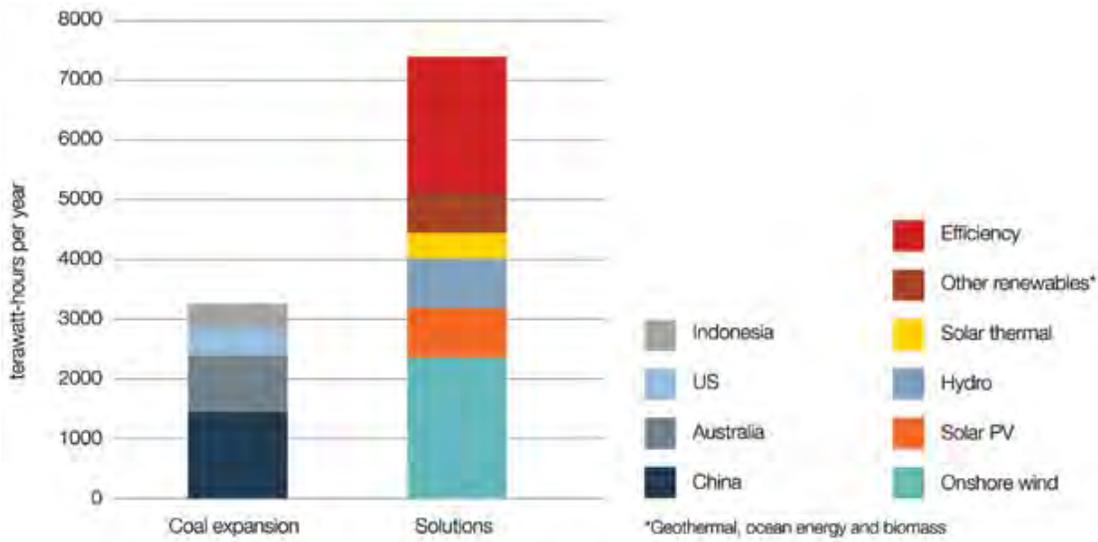
Greenpeace had developed a global Energy [R]evolution scenario that shows how to make the transition from dirty coal to renewable power by using existing renewable energy technologies and by increasing energy efficiency. If the current rate of growth in the renewable energy sector is maintained, wind and solar energy would overtake coal in electricity production in less than 15 years. The Energy [R]evolution scenario shows how coal-fired power generation could be eliminated as existing facilities retire, and how the world's power needs could be met with clean energy without building new coal plants.⁷¹

The global Energy [R]evolution scenario shows that a range of already existing technologies – from solar to wind, ocean and geothermal – could replace electricity generation from coal, based on what suits a local situation. For example, Spain, with its abundance of sun, has become a leader in concentrated solar thermal power, while Denmark with its windy coastline makes investment in offshore wind plants its priority. Electricity would also be generated locally – creating local jobs – without the need to rely on outdated national infrastructure that is costly to maintain. Renewable energy – if subject to the right development conditions, and if unfair barriers such as fossil fuel subsidies are removed – has the potential to be a massive global employer. The Energy [R]evolution shows renewable energy could employ up to 8 million people by 2020, compared to the coal industry's 2.8 million.⁷²

A key part of doing away with dirty fossil fuels is to ensure energy is used more efficiently. This will result in better products that waste less energy and that reduce energy costs to consumers. Implementing a strict technical standard to ensure all electrical appliances are designed to be as energy efficient as possible would mean it would be possible to switch off more than 340 coal-fired power plants in OECD countries, removing 2,000Mt of CO₂. Efficient lighting alone could close 80 coal-fired power plants,⁷³ reducing CO₂ emissions by 500Mt. Even bigger gains in demand reduction could be realised if entire systems – such as houses and cars – were rethought and made more efficient.

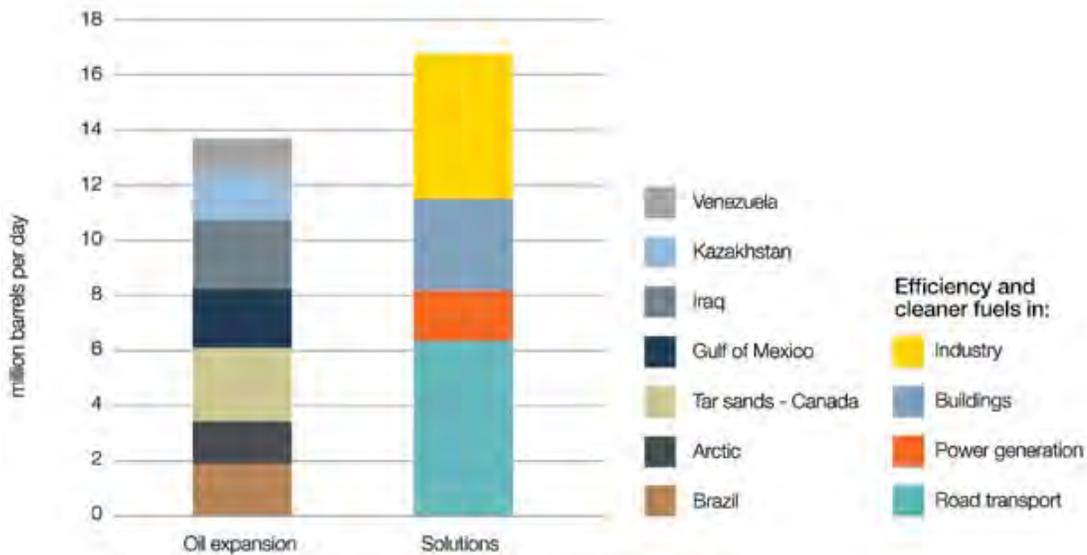
Dirty vs. Clean energy

Solutions for Coal: Realistic deployment by 2020



Source: Greenpeace 2012: Energy Revolution: A Sustainable World Energy Outlook

Solutions for Oil: Realistic deployment by 2020



Source: Greenpeace 2012: Energy Revolution: A Sustainable World Energy Outlook

Image Hellisheiði Geothermal Plant is situated at Hengill, an active volcanic ridge in SW Iceland. The Hellisheiði Power Station is the second largest geothermal power station in the world, and the largest in Iceland. The plant's purpose is to meet increasing demand for electricity and hot water for space heating in the industrial and domestic sectors. Estimated capacity for the completed Hellisheiði Plant is 300MW electricity and 400MW thermal energy. Once this capacity is reached, it will rank as the largest geothermal power station in the world in terms of installed capacity.



© STEVE MORGAN / GREENPEACE

Transitioning to renewable power generation would also save more money than retaining conventional electricity sources. The reference scenario in the Energy [R]evolution shows the impact of continued reliance on dirty energy sources would be \$1.3 trillion more a year – almost \$200 per person globally – spent on coal, oil and gas, than the no-fuel-cost pathway of the Energy [R]evolution. Overall, thanks to better energy efficiency and lower fuel costs, less money would be spent on power generation on the renewable energy pathway than on the dirty energy pathway.⁷⁴

An impressive roll out of renewable technology is already occurring. Renewable energy is now providing more than 30% of new electricity production globally.⁷⁵ By 2035 renewable energy could be increased to 65% of electricity production, and energy efficiency could be significantly increased, according to the Energy [R]evolution, to avoid the catastrophe of passing the point of no return. Clearly, renewable energy could turn the tide against coal. The world does not need the coal reserves in the US, China, Indonesia and Australia to be dug up and burned. Alternatives exist, and are being used right now.

No need for deadly fuel when clean options abound

About 54% of the 77 million of barrels of oil burned each day is used for transportation, in cars, trains, planes and ships.⁷⁶ The remaining barrels are used to provide heat for buildings and industrial processes as well as to generate some electricity.

If the fossil fuel industry is allowed to drill as much as it wants in waters off Brazil and in the Arctic, and to mine Canada's tar sands, it could produce 10 million barrels of oil a day from these sources alone. That's enough to fill 4,000 huge oil tankers⁷⁷ a year.

But governments don't need to push the climate to the point of no return and risk these pristine environments to appease the global addiction to oil. By implementing simple policies, such as upgraded fuel economy standards or transitioning to alternative technologies such as electric cars and renewable sources of power and heating, dramatic cuts can be made in demand for oil by more than the dirty oil projects would produce.

The Energy [R]evolution scenario shows that – through a combination of ambitious efforts to introduce higher-efficiency technologies for vehicles, a major switch to electric vehicles and incentives for travellers to save CO₂ – it would be possible to reduce transport emissions by 40% in 2050, compared to 2007 levels.⁷⁸

In the US, fuel economy standards introduced in the 1970s to ensure new cars used less fuel are already saving approximately 2.8 million barrels a day, almost equal to the targeted oil production in the Arctic.⁷⁹ Updating this policy to reflect advances in technology and rolling it out globally could save 15 million barrels, not to mention the millions that car owners would save when filling their tanks.

Advances are being made in batteries for electric cars all the time. A 2010 Deloitte report estimated that by 2020 electric and other “green” cars will account for one third of total global car sales,⁸⁰ while Nissan CEO Carlos Ghosn predicts that one in ten cars globally will run on battery power alone by 2020.⁸¹ Nissan has sold 27,000 all-electric model Leaf cars since its introduction in 2010, with forecasts for sales of 1.5 million zero-emission cars by 2016.⁸² Governments around the world are also beginning to support the electric-car industry with the US pledging \$2.4bn US dollars in federal grants for electric cars and batteries. China has provided \$15bn to kickstart its electric car industry, with further subsidies for transition technology.⁸³ If just 10% of driving were done in electric vehicles, more than 2 million barrels of oil would be saved every day.

Image A coal train near the town of Blackwater, Australia.



Greenpeace's Energy [R]evolution scenario has shown how demand for oil could be reduced in other transport sectors. Truck and ship freight could use less oil by improving their load handling to maximise the space available.⁸⁴ Increasing electric train use would also help, as trains are the most efficient form of transport. New technology would also dramatically help improve transport efficiency. For example, a 65% reduction in fuel use is possible in new aircraft by 2050.⁸⁵ Further policy measures that would encourage a reduction in passenger transport demand include incentives for working from home, stimulating the use of video conferencing in businesses and improved cycle paths in cities.

The remaining oil currently used in temperature control of buildings and in industry could also be replaced with cleaner fuels, including renewable electricity, sustainable plant-based bio oils, solar heating and district heating and cooling. Demand can be reduced through the implementation of smarter technology and energy efficiency policies.

For example, new buildings could be built to require minimal energy for heating and cooling, as is the case in tens of thousands of buildings in Germany and elsewhere in Europe. Or, buildings undergoing major renovation could be required to use renewable energy to provide a certain proportion of their heating and cooling, as is already in place in Australia and some other countries. Governments should also promote combined heat and power (CHP), which uses the heat generated during production and manufacturing that would normally be wasted and turns it into a source of energy that can heat buildings and water in the surrounding area.

Adopting policies to support energy-saving technology such as CHP, low-energy houses, as well as using cleaner fuels and renewable energy, would save another 9 million barrels of oil a day, making the assured destruction of environments such as the Arctic, Brazil's coastline and Canada's Boreal Forests completely unnecessary.

Image The Chicheng Wind Farm in Hebei Province, China, an area rich in wind energy resources.



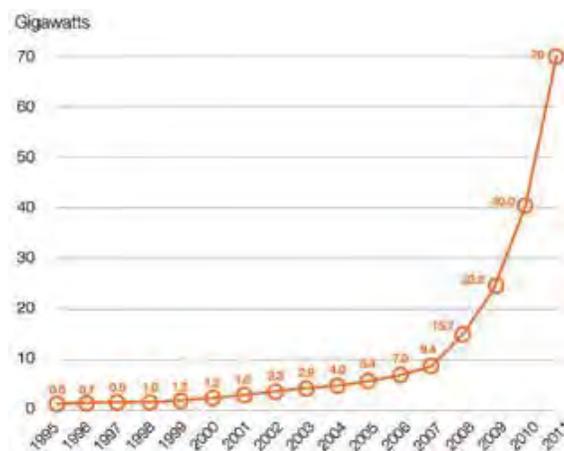
#6

The vision of the Energy [R]evolution can achieve results

Since 2007, Greenpeace has produced scientific modelling that identifies a sustainable path for the world to quit dirty, dangerous fossil fuels through a transition to renewable energy, and by using that energy more efficiently. The Energy [R]evolution scenario shows how governments and industry could achieve more power and mobility for less money, without damage to the environment and communities. More jobs, fairer and secure access to energy, and better standards of living mean that there are substantial benefits for not only the environment and the climate, but also for the economy and society.

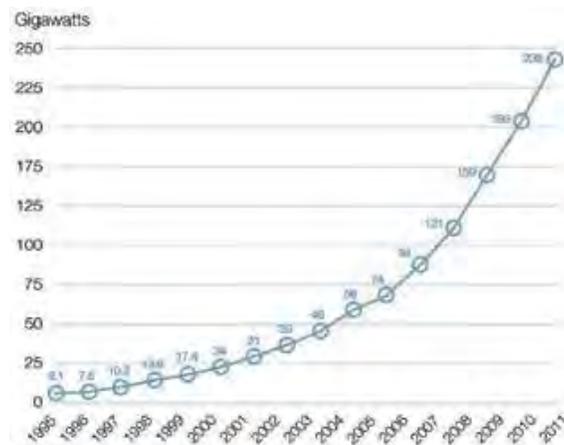
The speed with which renewable energy has been rolled out around the world by governments, companies and communities has meant that what started as a dream of a clean energy future is starting to become a reality. It's only through stepping up this revolution in clean energy that we can avoid the worst of the climate crisis.

Solar PV: total world capacity 1995-2011



Source: Renewables capacity graphs: REN21: Renewables 2012: Global Status Report. http://www.ren21.net/Portals/0/documents/activities/gsr/GSR2012_low%20res_FINAL.pdf

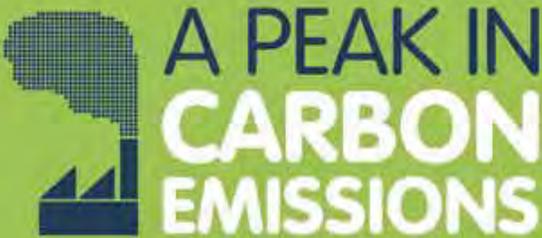
Wind power: total world capacity 1995-2011



Source: Renewables capacity graphs: REN21: Renewables 2012: Global Status Report. http://www.ren21.net/Portals/0/documents/activities/gsr/GSR2012_low%20res_FINAL.pdf

The Energy [R]evolution

Following Greenpeace's Energy [R]evolution would achieve the following:



from the **ENERGY + TRANSPORT** SECTORS IN THE NEXT FEW YEARS, AND AN

85%

CUT BY 2050⁸⁶



\$1.3 trillion

US dollars in fuel cost savings a year

By investing \$1.2 trillion in new power plants every year until 2050. The switch to renewable power will pay for itself in the long run. The savings would be made because once the infrastructure was built there would be

NO COST

TO HARNESS RENEWABLE ENERGY UNLIKE WITH CONVENTIONAL FOSSIL FUELS⁸⁹



LOWER ENERGY DEMAND IN THE TRANSPORT SECTOR THANKS TO A SHIFT TO SMALLER, ELECTRIC CARS AND THE USE OF MORE EFFICIENT MASS-TRANSIT METHODS, SUCH AS ELECTRIFIED TRAINS



IN 2030 ELECTRICITY WOULD PROVIDE

12%

OF THE TRANSPORT SECTOR'S

TOTAL ENERGY DEMAND

44%

IN 2050⁸⁸

37%

OF ELECTRICITY FROM
RENEWABLES
BY 2020

94%

OF ELECTRICITY FROM
RENEWABLES
BY 2050

WHEN A MASSIVE 15,100GW WOULD BE INSTALLED, MOSTLY IN THE FORM OF



GEOHERMAL



WIND



SOLAR PHOTOVOLTAIC

TECHNOLOGIES⁸⁷



MORE JOBS

22.6 MILLION

ENERGY SECTOR JOBS BY 2020

ONLY 17.8 MILLION

IN THE BUSINESS-AS-USUAL SCENARIO⁹⁰

Image Greenpeace activists protest at Shell drillship *Noble Discoverer*, anchored near Dutch Harbor in Unalaska. Greenpeace is campaigning to save the Arctic from attempts by oil companies to exploit the region's resources for short-term profit.



#7

Action!

This report marks the beginning of a sustained, global Greenpeace campaign to stop the dirtiest coal and oil-extraction projects featured here, and replace them with the available sustainable energy solutions. This campaign mirrors and supports existing community opposition to many of these projects. Greenpeace will continue to expose companies such as Shell and other fossil fuel corporations who pose direct threats to the environment and communities.

Community opposition is growing

Around the world, individuals and communities are joining together to oppose these projects. From openly calling for sit-ins and getting arrested (Keystone XL movement, Canada and the US), to denying fossil fuel companies access to land (Lock the Gate, Australia), and to tackling coal-mine expansion in China with science, strong local alliances have formed, and they are making inroads against the lobbying and spin pedalled by the fossil fuel industry.

How action is being taken!



Image Activists wave signs during a rally against the Keystone XL tar sands pipeline, outside the Ronald Reagan Building, where the final public hearing by the US Department of State is taking place.

Keystone XL movement

www.tarsandsaction.org

One of the grassroots climate movement's biggest successes in recent history occurred early in 2012 when US President Barack Obama knocked back permission until after the 2012 election for a 2,736km oil pipeline that would run from the tar sands of Alberta, Canada, to refineries on the US coast of the Gulf of Mexico. But now, the pressure is on the President to deliver his final verdict.⁹¹ Record numbers of Americans and a large number of Canadians opposed the pipeline even as Big Oil threatened the Obama Administration with "huge political consequences" for standing in its way. The campaign brought together the grassroots climate movement, NGOs, indigenous groups, farmers and ranchers, Canadians and Americans. The campaign quickly moved beyond political lobbying and online petitions, openly calling for people to get arrested to show their conviction. Over 1,200 people were arrested at sit-ins in front of the White House, with over a hundred more arrested at a sit-in in front of the Canadian Parliament. These sit-ins generated nationwide protests that placed the requisite pressure on the Obama Administration.

Power Past Coal

www.powerpastcoal.org

Power Past Coal is an ever-growing alliance of health, environmental, clean energy, faith, and community groups that are working together to stop coal exports through ports on the US West Coast. The movement – concerned about the health and environmental impacts of hundreds of coal trains rumbling through their communities, which includes the Columbia River Scenic Area – has the ear of Oregon governor John Kitzhaber, who has called for an environmental-impact review of the coal-transport plans. Thousands of local residents have joined with over 170 elected officials, and hundreds of businesses, faith leaders, and physicians, to express their concern or opposition to coal-export proposals. The coalition has been tirelessly working to raise awareness of the issue throughout the region and to ensure that public officials are protecting local communities, not coal industry profits, with local nodes organising local events on local issues. Robert F Kennedy Jr recently spoke at their rally in Portland, Oregon.



Image Signs spell out "Stop Coal" in Portland's Pioneer Square to show opposition to shipping dirty coal, for export to Asia, on trains and barges through Portland and other northwest communities.

Lock the Gate and Save the Reef

www.lockthegate.org.au
www.savethereef.org.au

Concerned that the health and the environment of communities near coal and gas mining across Australia have been ignored in the interests of energy-resource mining that is supported by morally and ethically absent governments, a mega-alliance of 114 community groups was formed under the Lock the Gate banner. There is a growing perception of political and regulatory failure to protect people, land, bush and water from coal and gas in Australia. Lock the Gate is the embodiment of a popular backlash against that failure. The signature tactic of the group is landholder and community blockades to deny access to fossil-fuel companies. Greenpeace Australia is working in conjunction with local communities to prevent the construction of major new coal terminals on the Great Barrier Reef coast.

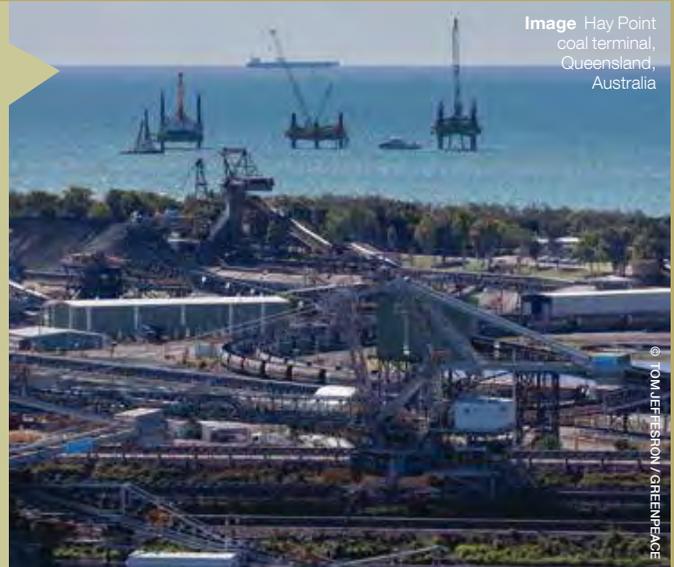


Image Hay Point coal terminal, Queensland, Australia

© TOM JEFFERSON / GREENPEACE



© JØBERG MODROW / GREENPEACE

Image Greenpeace activists protest against the Finnish icebreaker *Nordica* in the Baltic Sea in order to prevent it from heading to Shell's Arctic oil drilling project in the north of Alaska.

Direct action against Shell's Arctic oil drilling

www.savethearctic.org

Greenpeace has embarked on a major campaign to oppose Shell's plans to drill for oil in the Arctic. More than 50 activists took direct action in the first half of 2012 by boarding the Anglo-Dutch giant's icebreakers and oil-drilling ships in the seas off New Zealand, Sweden and Germany, while thousands more volunteers have voiced their own message to Shell, the first major international oil company to make exploitation of the Arctic a major focus. If Shell strikes oil, other global oil giants could quickly follow and spark an Arctic oil rush, threatening the pristine environment and the species and communities who call it home. The actions have galvanised public opposition to the threat to the Arctic, and 2.3 million people have now joined the campaign to declare the Arctic off limits to oil drilling and destructive industry.

Tackling coal mining expansion in China with science

www.greenpeace.org/china/zh or
www.greenpeace.org/eastasia

Greenpeace East Asia is working with Chinese academics to publish research that shows the economic, environmental and social benefits of investing heavily in renewable energy and energy efficiency instead of in coal. Greenpeace also investigates and documents the multiple impacts that coal has on society, from climate change to air and water pollution to health damage. Recent reports showed coal is responsible for 500,000 premature deaths in China every year,⁹² and that the sandstorms which plague the country also disperse coal ash – containing toxic arsenic, selenium and lead – from the western mining provinces across Beijing, Shanghai and Hong Kong. Greenpeace East Asia has said the Chinese government must quit coal if it is to realise its renewable energy and climate goals in its 12th Five Year Plan. The campaign encourages citizens of Hong Kong and mainland China to take personal action and support government action on climate change.

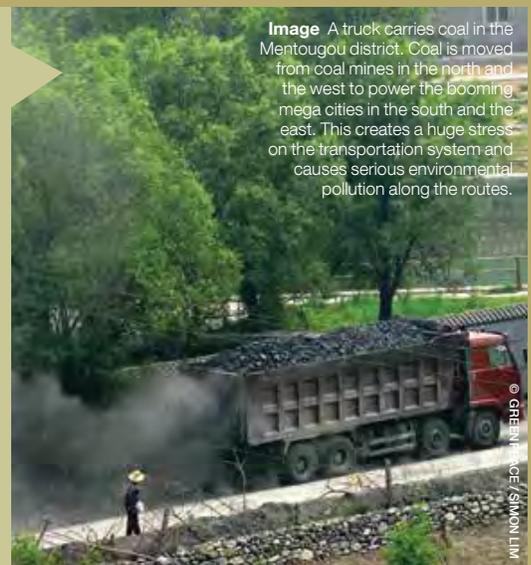


Image A truck carries coal in the Mentougou district. Coal is moved from coal mines in the north and the west to power the booming mega cities in the south and the east. This creates a huge stress on the transportation system and causes serious environmental pollution along the routes.

© GREENPEACE / SIMON LIM

Appendix

This section describes selected projects in depth, detailing the expected level of production for the coal, oil and gas projects, details of emission levels, and the severe environmental harm these projects will cause. Some of the world’s most iconic ecosystems are at risk from these projects, including the Great Barrier Reef off Australia, the fragile Arctic, the Yellow River of China, the Great Bear Rainforest on the west coast of Canada, habitat and mating grounds for whales off the coast of Brazil and the tropical rainforest of Indonesia.

Additional CO₂ emissions from the dirty energy projects by 2020 and 2035, million tonnes a year

	2020	2035
Coal expansion in China’s Western provinces	1380	1380
Coal in Australia (aggregated)	759	1181
Arctic drilling for oil and gas	519	1167
Coal in Indonesia	458	458
Tar sands in Canada	424	706
Coal in the US	422	422
Iraqi oil	417	814
Gulf of Mexico deepwater oil drilling	349	349
Deepwater oil drilling (pre-salt) Brazil	328	660
Caspian oil production (Kazakhstan)	286	382
Unconventional gas in the US	282	810
African gas production	261	586
Caspian gas production (Turkmenistan, Azerbaijan and Kazakhstan)	241	360
Orinoco tar sands (Venezuela)	191	361

Tens of thousands of coal ships threaten the Great Barrier Reef

Key facts: Increase in annual CO₂ by 2020: 760Mt

Country with comparable annual emissions: Germany

Companies involved: In the Bowen Basin, Hunter Valley, Gunnedah Basin and Surat Basin: Xstrata, BHP Billiton, Peabody, Anglo American, Rio Tinto, Vale, Yancoal.

In the Galilee Basin: Waratah Coal, Vale, Macmines Austasia, Adani and GVK.



© TOM JEFFERSON/GREENPENCE

Australia’s mining industry has a dirty plan to more than double its coal exports in a little over a decade – a move that would add an extra 900 million tonnes (Mt) of CO₂ a year to the atmosphere. In total, if Australian coal exports increase by the volume estimated by the Australian Bureau of Resource and Energy Economics, Australian export coal could be responsible in 2025 for 1,200Mt of carbon dioxide pollution annually.⁹³

Australia is already the world’s biggest coal exporter, and the second biggest exporter of thermal coal. The industry has been expanding in the states of New South Wales and Queensland, and further expansion plans are in the pipeline. These include plans to build up to nine new coal ports and terminals along the coast of the Great Barrier Reef World Heritage Area.⁹⁴ The Reef is under particular threat from coastal development and climate change – and the coal industry is a key driver of both.

The Great Barrier Reef Marine Park Authority and the Monitoring Mission of UN's Educational, Scientific and Cultural Organisation's (UNESCO),⁹⁵ which visited the Reef in 2012, have both said that decisions made in the next few years will determine its future.

New and expanded mines are eating away at farmland and putting water supplies at risk in the Hunter Valley, Liverpool Plains and Darling Downs. An entirely new region for mining, the Galilee Basin in Queensland, is proposed for exploitation to a scale of coal mining unprecedented in Australia. The Galilee Basin has long been too remote to make it economical for the mining industry. But with development in China and India generating a boom in coal prices, companies such as Hancock Coal (GVK), Waratah and Adani are proposing to build a series of mega mines that will cut the heart of central western Queensland open. For their plans to make financial sense, they want to build integrated mines, railways and ports to allow them to export their dirty product. The Australian government's estimate of coal export infrastructure needs to 2020 and 2025 includes only five of the nine mega mines proposed for the Galilee Basin. A Greenpeace investigation into the extent of mining proposed for this region found that, at full production, the nine mines currently proposed for the Galilee would together produce 330 million tonnes of coal.⁹⁶ That much coal would fill a train long enough to wrap around the world one and half times.⁹⁷

Mega mines mean mega emissions

Two of the mines slated for the Galilee Basin are expected to produce a total of more than 120 million tons of coal a year.⁹⁸ To put this into perspective, the largest mine currently operating in Australia produces roughly 30 million tons a year. Australia has recommitted to its promise to be part of a global effort to limit global warming to below 2°C. The expansion of the coal-export industry is not compatible with the government's commitment. The IEA, in its *World Energy Outlook 2011*, developed a scenario that estimates world energy consumption to 2035 that would be compatible with meeting the 2°C limit with global demand for coal peaking around 2016 and then declining by 2.7% a year on average.⁹⁹

The global picture

Burning Australian coal does not just affect Australia's contribution to global emissions since the emissions are "exported" to the countries using the coal. The impacts will be on the quality of life of the people living where the coal ends up getting burned. In India and China, two countries seen as the most likely potential customers for the coal, urban air pollution is already among the worst in the world.¹⁰⁰ Delhi's air had over four times more particulate pollution in 2010 than recommended in the country's air quality standard.¹⁰¹ Coal-fired power stations are one of the largest sources of the pollution plaguing people in Delhi. The Organisation for Economic Co-operation and Development (OECD) estimates that air pollution causes 270,000 premature deaths a year in India. In China – also seen as a guaranteed buyer – the death total is 600,000.¹⁰²

Great Barrier Reef to become a coal super-highway

To get the newly-mined coal out of Australia, the coal industry proposes several large new coal terminals and ports along the coastline of the Great Barrier Reef World Heritage Area. The bulk carriers to export the additional coal would travel through the Great Barrier Reef.¹⁰³ If all proposed new ports and terminals were to go ahead as planned, around 11,000 ships a year would cut through the Great Barrier Reef, seriously threatening marine biodiversity.¹⁰⁴

A coal accident recently affected the Reef. In 2010, a coal ship ran aground on the Reef, leaving a 3km scar across the coral,¹⁰⁵ where toxic paint has persisted in the environment. More ships mean more pollution, more risk of spills, groundings and collisions. The threat to the Reef from coastal industrialisation is so grave that UNESCO has been forced to speak out, warning the Australian government that if the coal mining projects go ahead, it would be forced to place the reef on the list of "in danger" sites. In June 2012, the World Heritage Committee passed a decision requesting that Australia "ensure that development is not permitted if it would impact individually or cumulatively on the Outstanding Universal Value of the property".¹⁰⁶ Following that warning, the government indicated it would revisit the approval for one of the mega mines.

Dredging an icon

One area particularly targeted for new coal-port development is Abbot Point, where four new coal terminals are proposed. For coal ships to be able to access three of these new coal terminals, three million cubic metres of sea floor would need to be dredged from the Great Barrier Reef World Heritage Area.¹⁰⁷ Dredging would destroy vital marine habitat, including seagrass meadows, which are feeding habitat for dugongs and green turtles. Green turtles currently use a beach next to Abbot Point for nesting, and both Abbot Point and Hay Point have been described as important mainland nesting habitat for flatback turtles in north Queensland.¹⁰⁸ Expanding the capacity of the ports would mean more light and noise pollution, more ships, and would inevitably degrade the “Outstanding Universal Value” of the Great Barrier Reef identified by UNESCO. Furthermore, marine mammals, including humpback whales, dugongs and dolphins, are sensitive to noise: construction of the “T3” coal terminal at Abbot Point would require 15 months of continual underwater pile-driving, including during the mating, nesting and calving seasons for some of these animals.¹⁰⁹

The Great Barrier Reef took millions of years to form, but there is a risk it would be wiped out altogether if the impacts from global warming are not controlled. Burning coal is a major cause of climate change, which may push the Great Barrier Reef to extinction thanks to coral bleaching and ocean acidification. According to a Report Card on Australia’s oceans released in August 2012, warming temperatures have already affected the growth of baby seabirds, changed the sex ratios of sea turtles, made coral bleaching more frequent and decreased the abundance of coral-dependent fishes.¹¹⁰ The report by the two science bodies in Australia found that if pollution continues to drive up global average temperatures: “Projected increases in the frequency and severity of thermal-stress events will increase the risk of mass coral-bleaching events, leading to chronic degradation of most coral reefs by the middle to late parts of the century.”¹¹¹ In other words, the water would be too hot for coral reefs to continue to live.

The additional coal mined from Australia under the current expansion plan, with the rest of the major fossil fuel developments highlighted in this report, would sound the death knell for the Great Barrier Reef.

The false jobs boom and Australia’s two-speed economy

The mining boom has driven up the Australian dollar, creating financial strain for the country’s manufacturing, tourism, and agriculture industries, which struggle to compete internationally. In Queensland, where much of the mining boom is situated, manufacturing declined 6.5% during 2011, and the number of international tourists coming to the state has fallen 6% since the beginning of the boom.¹¹²

The coal industry claims mining creates jobs, and while some jobs are indeed created when mines are opened, the majority are temporary and are at the expense of jobs in other industries. The Environmental Impact Statement for the “China First” mine, a proposal from multi-millionaire resource developer Clive Palmer, states that the mine would cost over 2,000 manufacturing jobs. The Australia Institute has shown that 39 mining projects planned for Queensland would cost 20,000 jobs, mostly in manufacturing – killing one job for every two the mining industry creates.¹¹³

Mining and the high prices of commodities create difficulties for ordinary Australians, most noticeably increasing the cost-of-living in regional areas affected by coal mining. While some mining jobs pay well, for the 99% of Queenslanders who don’t work in mining the boom results in higher housing costs and fewer jobs in tourism, manufacturing and agriculture.¹¹⁴ In autumn 2012, coal companies announced hundreds of job cuts in Queensland coal mines,¹¹⁵ and Australian government revenue forecasts for mining exports were dramatically revised down.¹¹⁶ Yet, at the same time, volumes of coal exported are still expected to increase.¹¹⁷ It’s a lose-lose-lose formula for jobs, the economy, and the global climate.

Who decides?

The regulatory and assessment process in Australia is not equipped to assess and determine the impact of coal projects in the context of their contribution to climate change. Decision makers are not considering the cumulative consequences of the coal-industry expansion on global efforts to reach the goal of limiting warming to below 2°C, and environmental assessment processes at the state and national levels do not address the question of the greenhouse gas emissions produced from these proposed mines, despite Australia’s commitment to the below 2°C goal. Contributing to exceeding the 2°C goal means the likely loss of the Great Barrier Reef altogether due to its inability to recover from possible annual bleaching at higher global temperatures.¹¹⁸

Rising US coal exports to feed Asia with dirty fuel

Increase in annual CO₂ by 2020: 420Mt

Country with comparable annual emissions: Mexico

Companies involved: Peabody Coal, Arch Coal, Ambre Energy.



Across the US, a combination of citizen action, new federal health standards, and economic conditions have forced the retirement of more than 100 coal-fired power plants.¹¹⁹ This has cut domestic demand for coal, so mining companies are looking for new markets off shore. They are attempting to build five new export terminals in the Pacific Northwest of the US.

If the coal industry succeeds, this expansion would allow 190 million more tons of coal a year to be loaded on to ships and sold to Asia. Planned US coal export expansion would double the existing total volume of all US coal ports and has the potential to add 420 million tonnes of CO₂ pollution to the atmosphere every year well before 2020, as much CO₂ as 100 million cars.¹²⁰ The coal for the proposed terminals would be strip mined from largely publicly owned reserves in Wyoming and Montana's Powder River Basin, and transported on long coal trains through Montana, Idaho, Washington, and Oregon.

The global picture

The goal of the US coal industry is to provide China and India with a substantial source of very cheap thermal coal. This would significantly increase global carbon emissions since the supply of US coal would have an impact on the energy habits of those two countries for the next 50 years.

Permitting a massive expansion of US coal exports to increase coal consumption in Asia would specifically undermine China's progress towards more energy-efficient power generation and usage. Thomas M Power, former University of Montana economics professor, reports that "several empirical studies of energy in China have demonstrated that coal consumption is highly sensitive to cost." A recent study found that coal consumption goes up by 12% when the cost of coal drops by 10%. Another report found that over half of the gain in China's improved "energy intensity" during the 1990s was a response to price. This means that, if the US provides cheaper coal, Asia will buy more coal than would otherwise be the case.¹²¹

The decline in coal use in the US has made coal companies, such as Peabody and Arch, look for new markets for their dirty product. Foreign coal companies, including Australia's Ambre Energy, are also betting big on US exports and hoping to fast-track proposals without thorough review. If successful, this plan by the fossil-fuel industry to seek profits in overseas markets would lock the world into dangerous climate change and create serious public health problems in communities from Billings, Montana to China's coastal cities.

Additional impacts would also be felt in the countries importing US coal. In China, over 400 million tonnes of coal ash is already being produced annually, and toxic dust, which gets picked up by the wind, blankets cities and villages throughout the country. A 10-year study of air pollution in Beijing and Shanghai found that coal ash is a major component of China's spring dust storms, during which levels of arsenic, lead, selenium and sulphur in the air exceed normal levels by up to 53 times.¹²²

Dirty trains and threatened wildlife

Hundreds of communities and sensitive ecosystems would be affected by the US coal industry's plan to transport coal from the Powder River Basin to the proposed export terminals. Dozens of 2km-long coal trains could pass through the Pacific Northwest every day, leaving a cloud of toxic coal dust and diesel fumes in their wake. According to the railway company BNSF, which is planning to haul Powder River Basin coal to the Pacific Northwest, the "amount of coal dust that escapes from PRB coal trains is surprisingly large. (...) BNSF has done studies indicating that from [200 to 900 kilograms] of coal can escape from a single loaded coal car. (...) In many areas, a thick layer of black coal dust can be observed along the railroad right of way and in between the tracks."¹²³

The export route would cut through sensitive ecosystems, such as the Columbia River Gorge and Coos Bay, which are already suffering from the impacts of climate change and high mercury levels. These areas are home to several species of endangered or threatened salmon, steelhead, green sturgeon, eucaloon, and leatherback sea turtles. The increase in coal train and barge traffic would have a further impact on these species. The Columbia River Gorge could see more than 40 coal trains a day.

Once the coal arrives at port terminals, it is typically kept in large piles where it is exposed to wind and weather. Stockpiles of coal at existing export terminals release fugitive emissions of coal dust into the surrounding community. The health impacts experienced by miners exposed to particulate matter from coal-dust pollution, such as asthma, bronchitis, emphysema, and other respiratory illnesses, would also become a problem in port and rail communities in the West. Coal dust contains toxic substances, including arsenic, cadmium, benzene and other volatile organic compounds that are known carcinogens. These substances have also been linked other diseases, such as strokes and lung and heart disease.¹²⁴

The US Environmental Protection Agency recently called on the Army Corps of Engineers to conduct a comprehensive, area-wide review of all the coal export plans based on concerns that there could be "significant impacts" on the health of residents and the environment.¹²⁵ These calls were echoed by Oregon Governor John Kitzhaber, Senators Murray (D-WA) and Merkley (D-OR), and dozens of public officials in the region. Over 25 cities, counties, and ports have passed resolutions expressing concern or opposition to coal exports through the Pacific Northwest.

Who pays the bill?

While Arch, Ambre, and Peabody hope to reap sizable profits in overseas markets, the US public would unfairly shoulder much of the financial burden. The economics of these export proposals rest, in part, on a massive public subsidy delivered through the US Department of Interior's coal-leasing program that charges the companies a pittance for a valuable resource. Coal companies are given cheap access to taxpayer-owned coal, and allowed to strip mine it from public lands, through auctions run by the Bureau of Land Management (BLM). The BLM allows companies to propose and set the terms of the lease to maximise their profits. As a result, only three federal coal auctions in the past 20 years have had more than one bidder. Knowing there won't be competition, companies are free to enter the lowest possible bid for this coal. In 2012, the BLM gave Peabody access to 721 million tons of taxpayer-owned coal for \$1.10 a ton.

The Institute for Energy Economics and Financial Analysis (IEEFA) estimates that the federal BLM's undervaluing of Powder River Basin coal has amounted to a public subsidy of \$28.9bn to the coal industry since 1980,¹²⁶ on the backs of US taxpayers. Beyond the direct financial impacts, the federal subsidy also increases the dangerous health, environmental, and climate impacts associated with mining, transporting, and burning coal. As US coal-mining companies increasingly seek export markets, BLM's justification that leasing publicly owned coal will help "meet the national coal demand" is being scrutinised.

Indonesian government risks Kalimantan wildlife with coal exports

Key facts: Increase in annual CO₂ by 2020: 460Mt

Country with comparable annual emissions: UK

Companies involved: KPC, Adaro, BHP, Banpu



On Kalimantan, the Indonesian part of the island of Borneo, dirty coal is waiting to be unearthed. Indonesia is already the world's largest exporter of thermal coal used by power stations and it provides about half of China's coal imports.¹²⁷

As a result of expansion in Kalimantan, Indonesia's coal output has been surging – reaching an average growth rate of 20 % a year since 2000, from 77 million tonnes a year to 325 million tonnes in 2011.¹²⁸

The planned increase in coal exports would produce an additional 460Mt of greenhouse gas emissions, as much CO₂ as the entire emissions of the UK in 2010.¹²⁹

The global picture

The extra coal would not only feed a burgeoning number of coal-fired power stations being built to meet local energy demand, but would largely go overseas to China, India, South Korea, Japan, and Taiwan, adding to the thick cloak of coal smoke hanging over Asia.¹³⁰

Who pays the bill?

Yet the value of the coal production is only 3%¹³¹ of Indonesia's GDP, and – despite ambitious coal expansion plans – the share is set to decline as the economy grows.¹³² Now, the Indonesian government is planning to spend public money on infrastructure investments and incentives that aim to dramatically increase coal exports from Kalimantan even further.¹³³ The toll on the people and the environment will be enormous.

To support this increase in coal exports, vast areas of Indonesian Borneo's wilderness – land with strong links to indigenous communities – have been allocated as coal mining concessions. And it's not just the new mines that will cut open the heart of Borneo, but new infrastructure for coal transportation will also be carved through the island's forests, home to one of the richest tropical forest ecosystems on the planet. The forest provides natural habitats for the endangered orangutan and other species of primates, as well as for important bird life, including the argus pheasant and hornbills.

While the Indonesian government pays lip service to environmental sustainability in the Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI), it largely ignores the terrible price those living around the mines will have to pay. Reports have surfaced of the oppression of those speaking out against the destructive mining practices.¹³⁴ The coal industry makes an intensive demand on water resources but also releases acids and sulphates into rivers. These pollutants destroy water supplies that in turn decimate fish stocks and contaminate crops, leading to loss of livelihoods, a reduction in food sources and health problems for local communities.

Since coal mining and deforestation began upstream along the Mahakam River, the World Wildlife Fund (WWF) "Heart of Borneo" report notes that flooding has become commonplace in Samarinda, in East Kalimantan. Major floods in 2008-2009 affected families and disrupted the economy, transportation, employment and livelihoods. The total cost of these floods was estimated at \$9m US dollars, while the cost of flood prevention is far greater than the town's income from coal. Construction of a flood polder has already cost \$7m, and the local government has put together a flood-mitigation plan that would cost another \$350m.¹³⁵

This deforestation-and-mining-induced flooding serves as an early indication of the kind of local impacts that Indonesians will experience if this dirty project goes ahead. On top of that would come the impacts of climate change on Indonesia, which include lower agricultural yields, leading to food shortages and price increases and damage to fisheries due to reduced coral reefs.¹³⁶

Greenpeace and other groups such as Friends of the Earth Indonesia (WALHI), the Indigenous Peoples Alliance (AMAN) and the Mining Advocacy Network (JATAM) are calling for a moratorium on coal mining on Kalimantan.¹³⁷ The groups are asking the government to review existing concession permits, particularly where they overlap with areas that have already been protected under a two-year forestry moratorium on the allocation of new concessions that was declared in May 2011.¹³⁸

Potential for renewable energy

Indonesia does not need to risk its natural environment and undermine Kalimantan's indigenous communities for the sake of development that is achieved through the unsustainable extraction of fossil fuels. There are other ways the country could meet its economic goals.

The Greenpeace Energy [R]evolution scenario for Indonesia shows how the country could meet its burgeoning energy demand with reliable, sustainable energy solutions without relying on coal. Instead of spending scarce public money on non-renewable, destructive extractive industries, the country could focus on high-value added industries, as a pathway to development.

Indonesia has the natural resources to become a leader in the provision of renewable geothermal energy. Together with other technologies such as solar and biomass, the country's renewable energy industry could be worth \$40bn by 2030; and could reduce the country's dependence on coal by as much as 15%. This kind of investment could cut Indonesia's emissions by at least 10% without taking into account other emissions-reduction strategies, such as energy efficiency.¹³⁹ These renewable-energy industries would keep on boosting Indonesia's economy into the future, long after the coal had run out.

China's clinging to coal an unnecessary contradiction

Key facts: Increase in annual CO₂ by 2015: 1,400Mt

Country with comparable annual emissions: Russia

Companies involved: China Datang Corporation, China Guodian Corporation, China Huadian Corporation, China Huaneng Group, China Power investment Corporation, Shenhua Group Corporation Ltd.



The biggest dirty-energy project on the planet is the planned 20% expansion of China's coal mining and production operations in five semi-arid western and northern provinces, where most of China's remaining reserves of the dirty fuel are to be found. If the mines, coal power stations and factories planned for this area during China's current five-year plan go ahead, they would spew 1,400 million tonnes of CO₂ into the atmosphere¹⁴⁰ – adding more than double the amount of Germany's total emissions in 2010.

China is both the world's largest producer and consumer of coal. The fuel supplies 70% of the country's energy needs and 80% of its electricity.¹⁴¹ It is, therefore, no surprise that 80% of China's carbon dioxide emissions come from burning coal.¹⁴²

In 2009, the World Energy Council reported that China had 114.5 billion short tons of recoverable coal reserves, the third-largest in the world behind the US and Russia, and equivalent to about 14% of the world's total reserves.¹⁴³ The five western and northern provinces are planning to increase production by 830 million tons a year by 2015.¹⁴⁴ This expansion would be at odds with policy goals set out in the country's five-year plan that calls for curbs on air pollution, a target to limit coal consumption growth by 2015 and reductions in CO₂ emissions in relation to economic output.¹⁴⁵

Climate change that challenges China

China will not escape impacts caused by dangerous climate change. The most serious risks the country faces include a decrease in food production, more severe droughts, the shrinking of glaciers that are the source of the major rivers, and more frequent extreme weather phenomena. If there are no adaptation measures, a 2.5°C rise in the average global temperature would lead to as much as a 20% decline in Chinese food production.¹⁴⁶ It has been estimated that by the year 2050, four western provinces of China – Inner Mongolia, Xinjiang, Gansu, Ningxia – would face intense water scarcity with water demand exceeding the available water resource.¹⁴⁷ Water resources are already under heavy stress in some parts of the country. Taking the middle section of the Yellow River as an example, 35% of the decline in water availability between 1970-2000 has been attributed to climate change.¹⁴⁸ Climate change will also lead to an increase in extreme weather phenomena, including droughts, floods, and high temperatures. Statistics show that in the 1950s storms on China's coasts resulted in a direct economic loss of millions of renminbi (RMB). This increased to billions in the later part of 1980s. Now, the annual average direct economic loss is 10bn RMB (\$1.6bn US dollars).¹⁴⁹

Where's the water?

The provinces earmarked for new coal bases would face a serious water problem if planned coal expansion were to go ahead. By the end of 2015, the annual water consumption of the coal-power bases in Inner Mongolia, Shaanxi, Ningxia would either equal or exceed the entire area's current total industrial water consumption (94.1% to 140.8% of current total industrial consumption).¹⁵⁰ That would mean these coal power bases, if fully developed, would consume a significant amount of water currently allocated to farming, urban residential use, environmental conservation and other sectors. The fierce competition for water resources between industrial and non-industrial sectors would very likely cause conflict and unrest in those areas.¹⁵¹

These provinces simply could not provide the massive water allocations required for increased coal mining, coal production, and coal chemical production, not to mention for the new infrastructure and transport projects which would come along with the expansion.

Coal production and use are already responsible for more than 10% of all water usage in China.¹⁵² Water is needed to mine and wash coal, as well as to cool coal-fired power plants. When coal mines are opened and the associated new heavy industry begins, water is secured by accessing local lakes and rivers, pumping groundwater, and constructing reservoirs to capture surface water, which diverts its normal flow and reabsorption into the soil. All three methods result in the water table sinking, leading to land degradation and desertification, damaging the livelihood of local farmer and herder communities.¹⁵³ Before coal is mined, the groundwater is extracted to allow access to the fossil fuel, resulting in large-scale groundwater depletion. It is estimated that for every ton of coal extracted, 2.5m³ of groundwater is pumped out of the ground and contaminated.¹⁵⁴

Iconic grasslands under threat

Pollution and the intense use of water have already caused desertification and degradation of some of Inner Mongolia's iconic grasslands, which herders rely on to feed their livestock. From 2004 to 2009, according to the National Bureau of Statistics, Inner Mongolia lost 46.8 million cubic metres from its total reserves of freshwater, a drop of 15%. During the same period, Xinjiang lost 95.5 million cubic metres. Some parts of the grasslands have turned into dust bowls and now cracks in the mud appear where natural lakes used to be. People in the area report that the production of the Xilingol grassland has been lowered. The Wulagai wetland has all but dried up.¹⁵⁵ The desert has started creeping into many other grasslands but there is still time to save many of these areas by limiting the expansion of coal mining.

Glaciers shrink under climate change

The Yellow River source region plays a vital role in supplying and regulating water to the entire water basin, with its length above Lanzhou providing 55.6% of the river's total water flow.¹⁵⁶ However, in the last 30 years, the region has lost 17% of its glaciers and the ice is melting at a rate that is now 10 times faster than it has been for the previous 300 years.¹⁵⁷

Old coal industry cities facing pollution problem

The coal industry is the backbone of cities such as Datong City in Shaanxi Province. The intense energy consumption and heavy pollution of the coal industry have brought significant environmental problems for Datong City, including, but not limited to, pollution of river water, the destruction of ground water, land sinking due to mining, and heavy air pollution. According to monitoring from 2005 by the Datong City Environmental Department, the water quality of most of the rivers in Datong City had become so poor that the water was essentially not usable.¹⁵⁸ Coal contributes to 85% of China's sulphur dioxide (SO₂) emissions, 67% of its nitrogen oxides (NO_x) emissions and 70% of particulate matter (PM).¹⁵⁹

Mother river struggling under industrial expansion

China's new coal-mining bases would also place further strain on the already polluted and struggling Yellow River – cradle of Chinese civilisation and the largest sandy river in the world. People in the cities and communities along the river depend on it for their livelihood. Removing too much water from the Yellow River would threaten ecosystems, cities and farming communities.

Oil pipelines threaten Canadian wilderness as tar sands greed grows

Key facts: Increase in annual CO₂ by 2020: 420 Mt

Country with comparable annual emissions:

Saudi Arabia

Companies involved: include Shell, Statoil, Total and Enbridge



The Canadian tar sands, in the province of Alberta, contain enough oil to produce 54 gigatons of carbon pollution¹⁶⁰ – that is twice the amount of carbon dioxide emitted by global oil use in our entire history, according to NASA Scientist James Hansen.¹⁶¹

Canadian oil transport company Enbridge and oil producers are trying to boost production in the tar sands from 1.5 to 4.5 million barrels of oil per day by 2035. This additional dirty oil would add 706Mt of CO₂ to the atmosphere every year.

The total reserve in the tar sands is estimated to be 170,000 million (170 billion) barrels of oil.¹⁶² Despite the damage posed by producing and burning this amount of oil, Enbridge wants to press ahead with a \$5.5bn Canadian dollar project to build the Northern Gateway pipeline from the tar sands across the Rocky Mountains through the Great Bear Rainforest to Canada's Pacific coast, where bitumen, mixed with a toxic dilutant, would be loaded onto supertankers for transport to Asia.^{163,164} Enbridge has also announced a \$3.2bn project to massively increase the capacity and efficiency of its pipelines to the US.¹⁶⁵ Another Canadian pipeline company, TransCanada, is proposing a \$7.6bn project to expand existing pipelines into the US to reach refineries in multiple locations.¹⁶⁶

Carbon-intensive processing

The tar sands are huge deposits of bitumen, a tar-like substance that's turned into oil through complex and energy-intensive processes that cause widespread environmental damage. One method requires, unlike any other petroleum product, the sands to be melted with super-headed steam so that a mixture of oil and water can be pumped to the surface. This is the way the oil industry currently prefers to extract the tar sands deposits that are deep underground.

The extraction processes for tar sands deposits mean the oil is more costly to produce than regular crude, uses more water and energy, and emits more carbon.¹⁶⁷ For example, two tons of tar sands are needed to produce a single barrel of oil. Three to five times more water and energy are required per barrel than any other oil source known to mankind.¹⁶⁸ At current levels of production, the tar sands use more water every day than a city of two million people and consume enough natural gas to heat six million homes.¹⁶⁹

With the tar sands, our global addiction to oil has us scraping the bottom of the barrel. The processes also pollute the Athabasca River, with an estimated 11 million litres of toxics seeping into the river everyday, lace the air with toxins, and convert pristine wilderness into wasteland.¹⁷⁰ The reserves lie beneath large areas of Boreal forest. Some areas are clearcut to make way for vast strip mines to develop the tar sands, the fastest growing source of greenhouse gas emissions in Canada.

The global Picture

Global oil consumption has grown only marginally after the early 2000s. Industrialised countries still burn just over half of the world's oil, but their consumption peaked in 2005 and hit the lowest level since 1995 in 2011. However, increasingly expensive and destructive oil production, such as tar sands mining and Arctic deep-sea drilling, is needed to maintain even the current level of consumption as developed oil fields are depleted.

The Canadian wilderness, as well as the Arctic, can be saved from destruction by more energy-efficient vehicles and increased use of electric transport systems powered by renewable energy. Car efficiency standards have already been put in place with good results in the EU, the US and China, among others, but they need to be ratcheted up and spread into more regions.

The true cost of mining the tar sands

Canada's indigenous First Nations communities are being affected by the tar sands. One community reports unusually high levels of rare cancers and autoimmune diseases.¹⁷¹ Not only is the process of refining tar sands carbon intensive, but the tar sands themselves are comprised primarily of cancer-causing polycyclic aromatic hydrocarbons.¹⁷² While the tar sands are often touted as Canada's economic driver, from a social-costs standpoint, people in the tar sands regions are paying a hefty price. Substance abuse, suicide, gambling and family violence have increased in the tar sands areas.¹⁷³ The Alberta government has been cutting essential social services from hospital beds to Aboriginal services, while oil companies rake in record profits. And while the tar sands create jobs in the short term, two out of three jobs are in construction, meaning once the initial work is completed, those jobs disappear.¹⁷⁴ The thousands of workers who have been brought in from outside the region have generated a housing crisis in northern Alberta as demand outstrips supply. Inflation in Edmonton and Calgary has also skyrocketed.¹⁷⁵

Government-backed destruction

Yet despite all of these social and environmental problems, the Alberta government has approved 100% of proposed tar sands projects that currently generate 40 million tons¹⁷⁶ of CO₂ a year, more than all the cars in Canada combined. These emissions are before the oil is burned, mainly in the US now. Alberta currently has the capacity to produce about 1.8 million barrels of oil a day from the tar sands. There are, however, projects under construction, or with all the necessary permits required, to expand this to 4.8 million barrels a day. Additionally, there are an intended 3.5 million barrels a day that have been announced or are undergoing regulatory review, including two new massive open pit mines from Shell.¹⁷⁷

The Enbridge “Northern Gateway” pipeline proposal – which is backed by the Harper government – threatens to allow a 28% expansion in tar sands development on 2008 levels.¹⁷⁸ This pipeline would span 1,170km from the tar sands in Alberta, across the iconic Rocky Mountains, then across the Great Bear Rainforest in British Columbia, the last intact temperate rainforest in the world, and end up on the coast of the rainforest.

The new Northern Gateway pipeline, if built, would cross 1,000 rivers and streams on the way to the pristine coastline. The pipeline would bring more than 200 crude-oil tankers through some of the world’s most treacherous waters each year, cutting across the migratory path of grey whales and the feeding zones of orca whales. The potential for oil spills contaminating the sensitive Great Bear Rainforest coast from tanker traffic moving tar sands oil to market, mainly in Asia, is high. Over the past decade, Enbridge’s existing pipelines have spilled, on average, more than once a week. It is an environmental disaster waiting to happen.¹⁷⁹

Communities call for Harper government to see the light

The massive pipeline-expansion projects are currently before an expedited review created by the Harper government. The government has also legislated to give itself the power to overthrow the findings of the review. Greenpeace along with concerned Canadians, including members of First Nations, are calling for the Canadian federal government to see the light, overturn its active support for the project and decline permission for new tar sands pipelines.

Pristine Arctic under threat from risky oil-drilling plans

Key facts: Increase in annual CO₂ by 2020: 520Mt

Country with comparable annual emissions: Canada

Companies involved: include Shell, Gazprom, Cairn Energy, Exxon Mobil, Rosneft, Statoil.



There’s an oil rush heading for the Arctic. If fossil fuel companies succeed with their plans to exploit oil and gas reserves in this fragile environment, there is the potential to add 975Mt of CO₂ to the atmosphere each year, by 2027 – more greenhouse gas emissions than Germany and the Netherlands combined in 2010.¹⁸⁰

As oil prices rise, fossil fuel companies, including Shell, Gazprom, Cairn Energy and Statoil, are snapping up licences to explore for oil they think lies under the freezing Arctic seas. Companies have pressured governments to allow more and more dangerous drilling with plans to extract 3 million barrels of oil a day by 2030.

One of the world’s last pristine environments, the Arctic, is caught in a deadly cycle. The region is warming twice as fast as the rest of the globe and is already experiencing some of the most severe climate impacts on Earth.¹⁸¹ The irony is that as climate change melts the Arctic sea ice at record speeds,¹⁸² it gives access to the Arctic’s hydrocarbon stores which may hold up to 90 billion barrels of oil – 13% of the world’s remaining oil reserves and enough to meet global demand for three years.¹⁸³

High-risk stakes ignored as gold rush mentality takes hold

Corporations have recently spent billions of dollars trying to open up the Arctic to new oil development, even though drilling there is a dangerous, high-risk and costly enterprise. Oil and gas have been identified in 25 geological areas in the Arctic, most of them offshore.¹⁸⁴

In the Russian Arctic, investment in offshore oil could top \$500bn US dollars.¹⁸⁵ For example, in 2011, Russia's state company Rosneft struck a multi-billion dollar strategic alliance with ExxonMobil to explore the Arctic's remote Kara Sea for oil.¹⁸⁶ This is despite the fact that Cairn spent hundreds of millions of pounds hiring oil rigs, transporting them to the Arctic, only to then abandon its drilling plans when it found no commercially extractable oil,¹⁸⁷ while earlier this year Shell scrapped its planned drilling in Alaska at significant cost.¹⁸⁸

An oil spill under these icy waters would have a catastrophic impact on a unique and one of the most beautiful landscapes on earth. The extremes of Arctic weather, which include hurricane-force winds, 10-metre seas, sub-zero temperatures and winter darkness, as well as its remote location, severely increase the risks, complicate logistics and present unparalleled difficulties for any clean-up operation.¹⁸⁹ Oil rigs face an almost ever-present risk from huge icebergs. Companies have to employ fleets of ships to drag them out of the way. However, some of the icebergs are so big that oil rigs are forced to stop drilling and move out of their way.

The Arctic drilling season is limited to a narrow window of a few months during the summer because of the return of winter sea-ice cover. In this short period of time, completing the huge logistical response needed to cap a leaking well would be almost impossible. For instance, the successful drilling of vital relief wells, crucial to permanently capping a ruptured well, could not be guaranteed before the winter ice returns.¹⁹⁰ If relief wells are left unfinished over the winter, oil could continue to gush out for up to two years. Yet despite these incredible risks, oil companies continue to recklessly lobby governments to relax safety rules for Arctic drilling.¹⁹¹

BP's response to the Gulf of Mexico oil spill is a case study in how difficult dealing with an Arctic spill could be. BP needed over 6,000 ships, more than 50,000 people and a massive cheque book to cap its leaking well, and even then it didn't manage it for months, causing the biggest environmental disaster in US history.¹⁹² Oil companies operating in the far north would simply not be able to mobilise this sort of response, as the US Coast Guard has admitted.¹⁹³

If the fossil fuel industry cannot adequately respond to a spill in temperate conditions near to large population centres and with the best response resources available, how can we be assured by claims that they are prepared to deal with a spill in the extreme Arctic environment? A top US Coast Guard's official recently admitted that they currently have "zero" spill response capability in the Arctic.¹⁹⁴

Indigenous communities and wildlife standing in the way

At risk in this mad oil rush are the Arctic's fragile ecosystem and the livelihoods of the region's local and Indigenous communities. The Arctic is home to a diverse range of unique wildlife, including polar bears, bearded seals, bowhead and blue whales, narwhal and salmon shark, and birds such as Brünnich's guillemot and gyrfalcon. In fact, the Arctic is home to hundreds of species of seabirds. The Alaska Maritime National Wildlife Refuge alone is habitat for 40 million seabirds.¹⁹⁵ The impact of a spill on these communities and on already-vulnerable animal species would be devastating and long-lasting. Even if there is no spill in the short term, toxic red-listed chemicals are often used in the drilling process and then dumped at sea, polluting the pristine environment and negatively affecting the local marine life.

A spill in the Arctic would have dire consequences for the local Indigenous peoples who inhabit the region and rely on the sea and ice for their livelihood. The US Geological Survey found that the long-term impact of oil development on Indigenous communities is unknown, because "additional information" is required to "determine the potential hazard to native subsistence livelihoods."

Brazil risks marine life by drilling miles under the sea for oil

Key facts: Increase in annual CO₂ by 2020: 330Mt

Country with comparable annual emissions:

South Africa

Companies involved: include Petrobrás, BP, Shell, Chevron, Total, Statoil



Brazil is rich in commodities. It is already the world's biggest exporter of beef, soya, sugar, and orange juice. Now it wants to add oil to that list after geologists found the largest deposit of oil in the Americas in 30 years. Between 50 and 100 billion barrels of oil are estimated to lie 8km below sea level, beneath a shifting layer of cretaceous salt deposits in an area covering over 112 thousand km² or the size of New York State.¹⁹⁶ The oil companies plan to extract as much as 2 million barrels a day by 2020. That would add 330Mt a year of carbon pollution to the atmosphere – as much as South Africa produced in 2010.¹⁹⁷

Major oil companies operate in the pre-salt fields of Brazil, including Chevron, Statoil and Shell, and a number of new oil and gas service companies have been developed. Keen to cash in, Petrobrás, the state-owned fossil fuel company, plans to invest \$53bn US dollars in exploration and production activities by 2015, up from \$33bn in 2010.¹⁹⁸

The Brazilian government has been licking its lips ever since the 2007 discovery, with then-president Luiz Inácio Lula da Silva declaring God was Brazilian for providing the reserves. His successor, Dilma Rousseff, a former energy minister who was chairman of Petrobrás for seven years during Lula's administration, has called the reserves her nation's "passport to the future".¹⁹⁹

Passport to climate destruction

But exploiting these oil reserves is not only a step backwards for the climate but also a step back for the environment. The reserves are trapped beneath a hard-to-penetrate layer of salt which is up to 1.9km thick plus layers of rock almost 5km thick and kilometres of seawater. This poses technical problems and risks not faced by the fossil fuel industry anywhere else in the world.²⁰⁰ For example, the Tupi field lies under 2.2km of water, almost a kilometre deeper than the 1.5km of water at BP's *Deepwater Horizon* rig²⁰¹. Underneath the water is 4.87km of rock. To access the oil, drills have to withstand unparalleled pressure from all the water and rock, as well as temperatures of up to 198°C and the corrosive nature of the rock and salt.²⁰² The salt is very resistant to drills and interferes with imaging technology.²⁰³

The pre-salt stores are formed by carbonates, a special kind of rock whose physical, mechanical, thermal and chemical properties are not well understood. The plastic and fluid features of this material may cause drill bits to get stuck during drilling. To get to the oil, drilling has to take a circuitous route rather than a vertical one in order to obtain the best performance. But changing the direction of drills could cause landslides in well tunnels, threatening the stability of the whole undersea area.

The technical challenges are enormous and the risks considerable. Furthermore, the amount of oil is just an estimate. The huge platform, shipping and drilling logistics required to extract this oil are not worth the investment as other, cheaper, cleaner sources of energy are already available (see page XX "Solutions for oil").

With such untested technology being used, these plans to drill deep under the seabed threaten Brazil's rich ocean ecosystems including whales' mating areas and coral reefs. The chemicals used to disperse oil sheens from the Deepwater horizon spill in the Gulf of Mexico in 2010 were still found in people's bodies and affecting their health a year after the disaster.²⁰⁴ That event killed 11 people,²⁰⁵ and spewed nearly 5 million barrels of oil into the ocean.²⁰⁶ Currently, the true potential impact of drilling for oil under the pre-salt layers off Brazil is unpredictable. The country has so far failed to develop any kind of risk assessment let alone emergency plans for such drilling.

Deep-sea oil already causing pollution

A spill has already occurred off the coast of Brazil. In November 2011, at Chevron's \$3.6bn Frade deep-sea-oil field, 370km northeast of Rio de Janeiro, a massive drill bit punctured an oil reservoir.²⁰⁷ More than 400,000 litres of oil spilled from undersea rock over two weeks. The main drilling contractor at the rig, Transocean Ltd, was also in charge of the *Deepwater Horizon* rig. Chevron has had its licence to drill suspended by the Brazilian authorities until the cause of the leak is ascertained.²⁰⁸ Brazilian prosecutors have charged 17 Chevron and Transocean executives for "crimes against the environment".²⁰⁹ The companies are also being sued by the prosecutors for \$10.6bn in damages and have already been fined more than \$100m by the state. Wells in the vicinity have continued to leak this year, but still the Brazilian government promotes this vision of a dirty fuel future.²¹⁰

Even after recent spills, a contingency plan is still waiting to be agreed to by the Brazilian government. In the US, on the other hand, the Oil Spill Liability Trust Fund counts on a budget of up to \$1bn to clean up oil spills and repair damage caused to third parties in these situations.

Renewable opportunity for Brazil

The irony is that Brazil is actually a world leader when it comes to renewable energy. Sugarcane-based ethanol powers 20% of its road transport, and the country gets 85% of its electricity from hydropower, biomass and wind power.²¹¹

Brazil could be the first of the up-and-coming BRIC nations (Brazil, Russia, India and China) and the first large economy completely powered by renewable energy, thereby completely insulating it from the vagaries of international fossil-fuel markets. Brazil's push towards renewable energy is one of the world's most ambitious, bolstered by its pledge to reduce carbon emissions 39% by 2020.

The global renewable-energy leadership demonstrated by Brazil is undermined by the dangerous and expensive business of drilling for pre-salt oil. Exporting dirty, deep-sea oil produces masses of carbon pollution that will threaten not only Brazil's, but global efforts, to reduce emissions and limit dangerous climate change. The country has an opportunity to truly be a world leader by turning its back on risky deep-sea oil drilling and replacing the income through exporting its renewable technologies and thus creating thousands of green jobs.

Brazil could also be ambitious in fuel efficiency. Until now, Brazil has played a retrogressive role in addressing the transport sector. Federal government measures to reduce Brazil's oil demand have been delayed and the government has approved and promoted policies to stimulate the economy by reducing taxes on vehicles to increase car sales and is regulating to keep the price of fuel low.

The transport sector is the biggest fossil CO₂ emitter in Brazil, larger than power generation or industry.²¹² Yet Brazil has no fuel-economy standards for cars, unlike the US, China and the EU. This lack of fuel economy standards contributes to greater emissions and greater costs for the average Brazilian. If regulations on fuel efficiency were improved and alternative clean sources of energy were developed in Brazil and globally, demand for oil could be reduced dramatically, removing the need to embark on the path of dangerous pre-salt exploration

Raising awareness of the pre-salt risks

Since the Brazilian government set the regulatory framework for drilling pre-salt reserves in 2009, Greenpeace Brazil has worked to raise awareness of the impact on the global climate of the estimated total emissions of greenhouse gases of the reserves. In two reports, Greenpeace highlighted the conflict of oil exploration with marine conservation and the consequences for the climate if all the oil currently produced in the country were burned. Greenpeace also championed the recent development of renewable energy sources such as solar, wind and biomass in different regions of Brazil and the positive impacts of exploring this potential. More recently, Greenpeace has publicly asked for a contingency plan for oil spills, especially after the Chevron accident in 2011.

Endnotes

- 1** DARA and the Climate Vulnerable Forum (2012). Climate Vulnerability Monitor: A Guide to the Cold Calculus of a Hot Planet. 2nd Edition, DARA, Madrid, Spain, p. 24.
<http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/>
- 2** The additional emissions from the new dirty energy projects in 2020 are estimated at 6.3Gt CO₂/year, while US emissions from fossil fuel burning stood at 5.4Gt CO₂ in 2010.
Meindersma W, Schaeffer M, Groenenberg H & Blok K (2012). Effects of New Fossil Fuel Developments on the Possibilities of Meeting 2°C Scenarios. IEA (2012a). CO₂ Emissions from Fuel Combustion 2012.
<http://www.iea.org/publications/freepublications/publication/name,4010,en.html>
- 3** IEA (2012a) op cit and IEA (2012b). Global carbon-dioxide emissions increase by 1.0Gt in 2011 to record high. Press release. Global CO₂ emissions increased by 1.33Gt in 2010, exceeding the previous record of 1.24Gt in 2004. The average growth rate between 1990 and 2011 was 1.9% and the IEA World Energy Outlook 2011 Current Policies Scenario, estimated to be consistent with a long-run warming of 5.3°C, projects a growth rate of 2.1% from 2009 to 2020.
- 4** IEA (2011). World Energy Outlook 2011.
- 5** Meindersma W et al (2012) op cit, p12
- 6** The IPCC First Assessment Report, issued in 1990, concluded on the basis of available science, that continued emission growth would cause sea level rise, severe impacts on agriculture in warm regions, risk of extinctions, and immediate reductions of over 60% in CO₂ emissions would be needed to stabilize concentrations.
See Climate Change: The IPCC Scientific Assessment. 1990. Report prepared for Intergovernmental Panel on Climate Change by Working Group I
http://www.ipcc.ch/publications_and_data/publications_ipcc_first_assessment_1990_wg1.shtml#.UMhdQoWomaM
- 7** IEA (2012c). World Energy Outlook 2012. 12 November 2012.
<http://www.worldenergyoutlook.org/publications/weo-2012/#d.en.26099>
World Bank (2012a). Turn down the Heat. November 2012.
http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf
- 8** IEA (2012c) op cit.
- 9** Hansen J (2012a). Climate change is here — and worse than we thought. The Washington Post, 4 August 2012.
http://www.washingtonpost.com/opinions/climate-change-is-here--and-worse-than-we-thought/2012/08/03/6ae604c2-dd90-11e1-8e43-4a3c4375504a_story.html
- 10** The New York Times (2012a). Hurricanes and Tropical Storms (Hurricane Sandy)
http://topics.nytimes.com/top/reference/timestopics/subjects/h/hurricanes_and_tropical_storms/index.html?inline=nyt-classifier
- 11** The New York Times (2012b). Drought (US Drought of 2012)
<http://topics.nytimes.com/top/news/science/topics/drought/index.html>
- 12** Severson K, Johnson K (2011). Drought spreads pain from Florida to Arizona. The New York Times, 11 July 2011
<http://www.nytimes.com/2011/07/12/us/12drought.html?pagewanted=all&r=0>
- 13** Gilbert N (2010). Russia counts environmental cost of wildfires. Nature. 12 August 2010.
<http://www.nature.com/news/2010/100812/full/news.2010.404.html>
Rozhnov K (2010). Russia counts the cost of drought and wildfires. BBC, 25 August 2010.
<http://www.bbc.co.uk/news/business-11084236>
- 14** Robine J-M, Siu Lan KC, Le Roy S, Van Oyen H, Griffiths C, Michel JP, Herrmann FR (2008). Death toll exceeded 70,000 in Europe during the summer of 2003. Comptes Rendus Biologies 331 (2): 171–178. doi:10.1016/j.crvi.2007.12.001.
- 15** NASA Earth Observatory (2010). Global Temperatures 1880-2009.
<http://earthobservatory.nasa.gov/Features/WorldOfChange/decadaltemp.php>
- 16** DARA and the Climate Vulnerable Forum (2012) op cit.
- 17** Meindersma W et al (2012) op cit, p20
- 18** Ibid, p3
- 19** Mcrone A, Usher E, Sonntag-O'Brien V, Moslener U & Gruening C (2012). Global Trends in Renewable Energy Investment 2012. United Nations Environment Programme: Frankfurt School Collaborating Centre for Climate and Sustainable Energy Finance, Frankfurt, Germany. September 2012.
<http://fs-unep-centre.org/sites/default/files/publications/globaltrendsreport2012final.pdf>
- 20** Greenpeace International (2012). Energy Revolution: A Sustainable World Energy Outlook. Greenpeace International, Amsterdam, The Netherlands. September 2012.
<http://www.greenpeace.org/international/en/publications/Campaign-reports/Climate-Reports/Energy-Revolution-2012/>
- 21** The coal produced from the dirty energy projects in 2020 would suffice to generate 3,500TWh of electricity if fired in power plants with 43% thermal efficiency (LHV basis). The projected additions of renewable energy generation by 2020 in the Energy [R]evolution amount to 5,100TWh/year, and increased use of energy-saving technologies results in an additional 2,300TWh/year reduction in electricity consumption, net of measures that substitute electricity for fossil fuels in transport, industry and buildings. Greenpeace International (2012) op cit, p295.
- 22** The dirty energy projects would produce some 13.6mbd of oil in 2020. The oil-saving measures identified in the Energy [R]evolution in transport, power generation, buildings and industry would save 17.6mbd of oil by the same year. Greenpeace International (2012) op cit, p295.
- 23** United Nations Framework Convention on Climate Change (UNFCCC) (2009). Copenhagen Climate Change Conference - December 2009.
http://unfccc.int/meetings/copenhagen_dec_2009/meeting/6295.php
- 24** IEA (2012a) op cit and IEA (2012b) op cit.
Olivier JGJ, Janssens-Maenhout G & Peters JAHW (2012). Trends in global CO₂ emissions. 2012 Report.
<http://edgar.jrc.ec.europa.eu/CO2REPORT2012.pdf>
Olivier JGJ, Janssens-Maenhout G, Peters JAHW & Wilson J (2011). Long-term trend in global CO₂ emissions. 2011 report.
http://edgar.jrc.ec.europa.eu/news_docs/CO2%20Mondiaal_%20webdef_19sept.pdf
- 25** 1 gigaton = 1 billion tons (1,000,000,000 tonnes)
- 26** US emissions from fossil fuel burning stood at 5.4Gt CO₂ in 2010. Meindersma W et al (2012) op cit.
IEA (2012a) op cit.
- 27** IEA (2012c) op cit.
- 28** IEA (2012c) op cit.; World Bank (2012a) op cit.
- 29** World Bank (2012b). New Report examines risks of 4 degree hotter world by end of century. 18 November 2012.
<http://www.worldbank.org/en/news/2012/11/18/new-report-examines-risks-of-degree-hotter-world-by-end-of-century>
- 30** IEA (2012c) op cit.

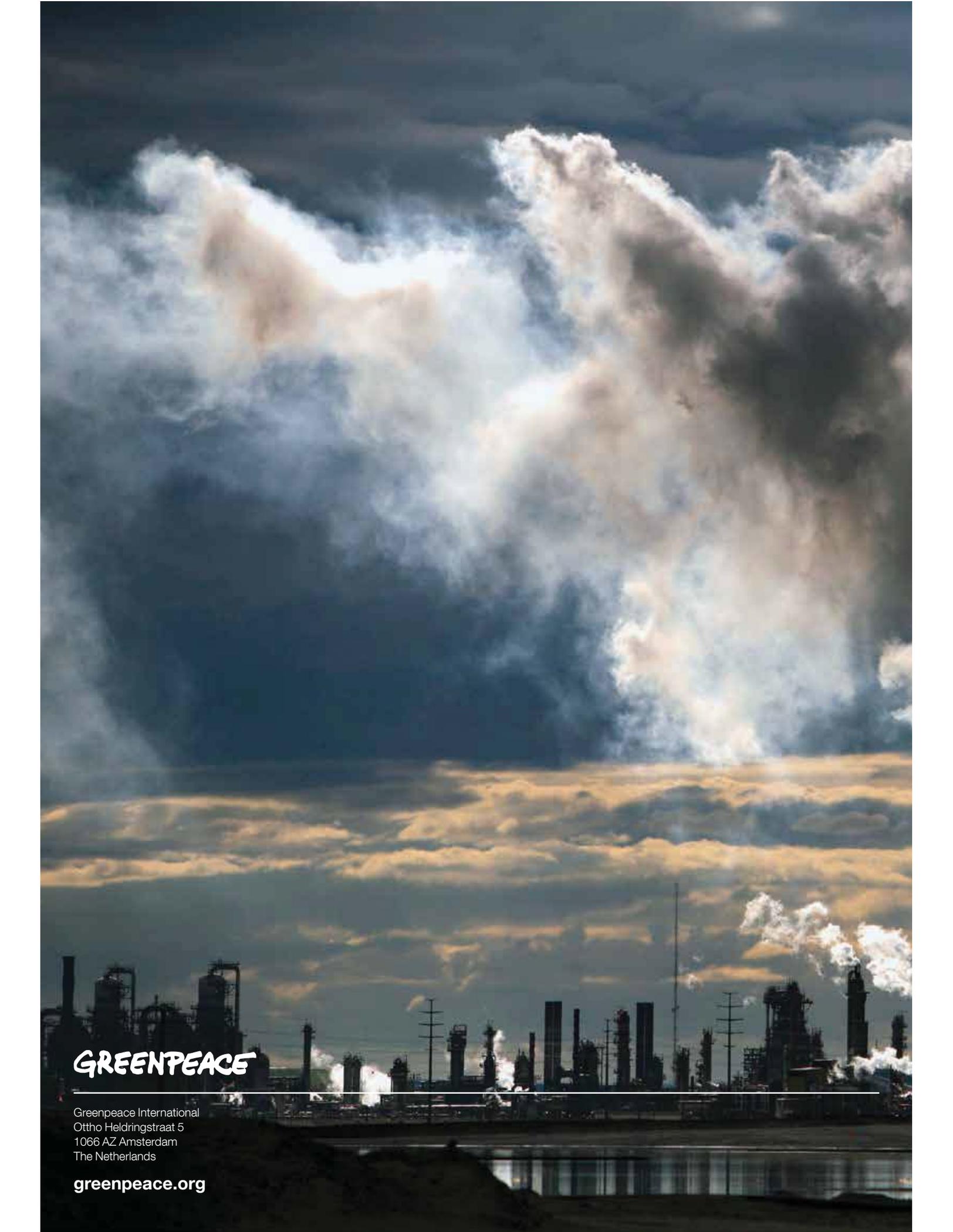
- 31** Barrett PM & Millard P (2012). Chevron Brazil Spill Shows Drillers Still Trip in Crises. Bloomberg. 11 May 2012.
<http://www.bloomberg.com/news/2012-05-10/chevron-brazil-spill-shows-drillers-still-trip-in-crises.html>
- 32** All output and emission numbers are from the Ecofys report. Meindertsma W & Blok K (2012) op cit. All country emission numbers are from IEA (2012a) op cit.
- 33** Australia's domestic CO₂ emissions were 384Mt in 2010. IEA (2012a) op cit. The CO₂ emissions associated with Australia's coal exports would reach 1.7Gt by 2025 according to the projections cited in the Ecofys study.
- 34** Petrobras (2012). Deep Future. October 2012.
<http://www.petrobras.com/en/magazine/post/deep-future.htm>
Barrett PM & Millard P (2012) op cit.
- 35** Yang A, Yiyun C & Pan M (2012). Global Coal Risk Assessment Working Paper. World Resources Institute, Washington DC, United States.
<http://www.wri.org/publication/global-coal-risk-assessment>
- 36** European Environment Agency (2012). Why did greenhouse gas emissions increase in the EU in 2010? EEA Analysis In Brief. EEA, Copenhagen, Denmark, p5.
<http://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2012/why-did-greenhouse-gas-emissions.pdf>
- 37** Eurostat (2011). Energy Production and Imports. October 2012.
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_production_and_imports
- 38** The reference scenario is based on the Potsdam Institute for Climate Impact research PRIMAP4 Baseline Reference; available at
<http://sites.google.com/a/primap.org/www/the-primap-model/documentation/baselines/primap4>
- 39** IEA (2012c) op cit, p246.
- 40** IEA (2012c) op cit.
- 41** IEA (2011). World Energy Outlook 2011. IEA, Paris, France, p205.
- 42** Abraham J (2011). Very worried about escalating emissions? You should be. The Conversation, 11 June 2011.
<http://theconversation.edu.au/very-worried-about-escalating-emissions-you-should-be-1601>
- 43** Van Noorden R (2012). IEA calls for focus on energy efficiency, Nature News Blog, 12 November 2012.
<http://blogs.nature.com/news/2012/11/iea-calls-for-focus-on-energy-efficiency.html>
- 44** IEA (2012d). World Energy Outlook 2012. Factsheet.
<http://www.worldenergyoutlook.org/media/weowebsite/2012/factsheets.pdf>
- 45** United Nations Framework Convention on Climate Change (UNFCCC) (2010). Durban conference delivers breakthrough in international community's response to climate change. October 2012.
http://unfccc.int/files/press_releases_advisories/application/pdf/pr20111112cop17final.pdf
EU Climate Change Expert Group (2008). The 2nd Target: Background on Impacts, Emissions Pathways and Mitigation Costs. European Commission, Brussels, Belgium. September 2012.
http://ec.europa.eu/clima/policies/international/negotiations/future/docs/brochure_2c_en.pdf
- 46** IEA (2011) op cit, p232.
- 47** 620Mt from China, 410Mt from Australia, 200Mt from US and 180Mt from Indonesia, as per Ecofys projections. Comparison to power plant consumption assumes 1GW power plants with 43% thermal efficiency (LHV basis) and operating 7000 h/a.
- 48** BP (2012). Statistical review of world energy, 2012. June 2012.
<http://www.bp.com/sectionbodycopy.do?categoryId=7500&contentId=7068481>
- 49** For example, an article in the prestigious medical journal Lancet estimated that coal-fired power generation in the EU results, on average, in 24.5 deaths per terawatt-hour generated, despite the relatively stringent pollution control requirements. In 2010, coal-fired power generation stood at 8,700 terawatt-hours globally. Markandaya A & Wilkinson P (2007). Energy and health: electricity generation. Lancet 370:979-990. Lancet (2007). 370:979 – 90
- 50** IEA (2012c) op cit.
- 51** 2.0mbd from Brazil, 1.5 from the Arctic, 2.7 from Canada, 2.1 from Gulf of Mexico, 2.5 from Iraq, 1.7 from Kazakhstan and 1.2 from Venezuela as per Ecofys projections.
- 52** Assuming gas consumption of 6l/100km and 30,000km/year/vehicle driven.
- 53** Reuters (2012a). Factbox: Storm Sandy blamed for at least 132 deaths in US, Canada. 16 November 2012.
<http://www.reuters.com/article/2012/11/16/us-storm-sandy-deaths-idUSBRE8AF0Z20121116>
Associated Press (2012). 31 Haiti storm death toll to 54; up to 71 for region. October 2012.
- 54** Reuters (2012b). New York, New Jersey put \$71 billion price tag on Sandy. 26 November 2012.
- 55** Ibid.
- 56** Robine J-M et al (2008) op cit.
- 57** Hansen J (2012) op cit.
- 58** Lowrey A & Nixon R (2012). Severe Drought Seen as Driving Cost of Food Up, The New York Times, 25 July 2012.
http://www.nytimes.com/2012/07/26/business/food-prices-to-rise-in-wake-of-severe-drought.html?hp&_r=0
Ruitenberg R (2012). Europe Heat Wave Witing Corn Adds to US Drought, Bloomberg, 24 July 2012.
<http://www.bloomberg.com/news/2012-07-23/europe-heat-wave-witing-corn-adds-to-u-s-drought-commodities.html>
- 59** Hansen J (2012) op cit.
- 60** DARA and the Climate Vulnerable Forum (2012) op cit, p24
- 61** Ibid, p23
- 62** Chestney N (2012). 100 mln will die by 2030 if world fails to act on climate – report. Reuters, 27 September, 2012.
<http://www.reuters.com/article/2012/09/25/climate-inaction-idINDEE88OOH20120925>
- 63** Willenbockel D (2012). Extreme Weather Events and Crop Price Spikes in a Changing Climate, Oxfam, Oxford, United Kingdom. September 2012.
<http://www.oxfam.org/sites/www.oxfam.org/files/20120905-rr-extreme-weather-events-crop-price-spikes-en.pdf>
- 64** Sydney Morning Herald (2012). Climate change to hit poor through food price hikes: Oxfam. Sydney Morning Herald. 5 September 2012.
<http://www.smh.com.au/environment/climate-change-to-hit-poor-through-food-price-hikes-oxfam-20120905-25egb.html#ixzz27w4bczb7>
- 65** United Nations Food and Agriculture Organisation (FAO) (2012). Joint statement from FAO, IFAD and WFP on international food prices: UN Agencies appeal for swift, coordinated action. September 2012.
<http://www.fao.org/news/story/en/item/155472/icode/>

- 66** Compton J, Wiggins S & Keats S (2010). Impact of the global food crisis on the poor: what is the evidence? Overseas Development Institute, London, United Kingdom. <http://www.odi.org.uk/resources/docs/6371.pdf>
- 67** Intergovernmental Panel on Climate Change (IPCC) (2007). Climate Change 2007: The Physical Science Basis. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- 68** IPCC (2007) op cit.
- 69** UNEP (2012). Policy Implications of Warming Permafrost. Nairobi, Kenya. <http://www.unep.org/pdf/permafrost.pdf>
- 70** Meindertma W et al (2012) op cit.
- 71** Greenpeace International (2012) op cit.
- 72** Ibid.
- 73** Greenpeace International (2010). Energy Revolution: A Sustainable World Energy Outlook. Greenpeace International, Amsterdam, The Netherlands.
- 74** Greenpeace International (2012) op cit.
- 75** Mcrone A et al (2012) op cit.
- 76** IEA (2012c) op cit.
- 77** 120,000 DWT
- 78** Greenpeace International (2012) op cit.
- 79** Committee on the Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards, National Research Council, Board On Energy and Environmental Systems (2002). Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards (2002). The National Academies Press, Washington, United States. ISBN: 9780309090377
- 80** International Business Times (2010). Electric Vehicles to represent one third of all car sales by 2030: Deloitte. International Business Times, 22 October 2010. <http://www.ibtimes.com/articles/74753/20101022/green-cars-deloitte-electric-vehicles.htm>
- 81** Blanco S (2012). Carlos Ghosn: 27,000 Leafs Sold Worldwide, with Many More to Come, Auto Green Blog, 4 April 2012. <http://green.autoblog.com/2012/04/04/carlos-ghosn-27-000-nissan-leafs-sold-worldwide-many-many-mor/>
- 82** Ibid.
- 83** The Economist (2012). Electric Cars in China, The Economist, 5 May 2012. <http://www.economist.com/node/21554195>
- 84** Greenpeace International (2010) op cit.
- 85** Ibid.
- 86** Greenpeace International (2012) op cit, p85.
- 87** Ibid, p17.
- 88** Ibid, p18.
- 89** Teske S (2012). The Energy Revolution will pay off in savings and jobs. Greenpeace International. September 2012. <http://www.greenpeace.org/international/en/news/Blogs/makingwaves/the-energy-revolution-will-pay-off-in-savings/blog/40772/>
- 90** Ibid.
- 91** The Associated Press (2012). Obama's Keystone XL decision will set tone for 2nd term. 1 December 2012. <http://www.cbc.ca/news/world/story/2012/12/01/obama-keystone-xl-pipeline-decision.html>
- 92** Greenpeace China (2010). The True Cost of Coal - Air pollution and public health. August 2010. <http://www.greenpeace.org/eastasia/publications/reports/climate-energy/2010/report-coal-health-summary/>
- 93** Export volumes from Bureau of Resources and Energy Economics (2012). Australian bulk commodity exports and infrastructure – outlook to 2025. Canberra, Australia. GHG emission factors from Department of Climate Change and Energy Efficiency, 2011. National Greenhouse Accounts Factors. Australia.
- 94** Greenpeace Australia Pacific (2012). Cooking the Climate, Wrecking the Reef. Greenpeace Australia Pacific, Sydney, Australia. September 2012, p 35 <http://www.greenpeace.org/australia/en/what-we-do/climate/resources/reports/Cooking-the-climate-Wrecking-the-reef/>
- 95** World Heritage Committee (WHC) (2012). Mission Report, Reactive Monitoring Mission to Great Barrier Reef, Australia, 6-14 March 2012. 12/36. COM <http://whc.unesco.org/en/documents/117104>
- 96** Greenpeace Australia Pacific (2012) op cit.
- 97** 20 metres-long hopper cars with 100 tonne capacity; Earth's circumference 40,000km.
- 98** The Loy Yang brown coal mine is the self-proclaimed largest coal mine on the Southern Hemisphere with a 30 million tonne annual output. Loy Yang Power. Mine Information. <http://www.loyyangpower.com.au/>
- 99** IEA (2011) op cit.
- 100** WHO (2011). Urban outdoor air pollution database. Department of Public Health and Environment, World Health Organisation, Geneva, Switzerland
- 101** India Today (2012). Delhi has the highest level of air pollutants: Environment ministry. 30 November 2012. <http://indiatoday.intoday.in/story/delhi-is-air-pollution-capital-too/1/162114.html>
- 102** Calculated from death rates per million inhabitants in OECD. 2008. OECD Environmental Outlook to 2030. OECD, Paris, France, p257-259. Population data taken from United Nations Department of Economic and Social Affairs (2012). World Population Prospects. <http://esa.un.org/unpd/wpp/index.htm>
- 103** If port expansions proceed as proposed, the Abbot Point coal port could have a capacity of 445Mtpa and the coal industrial port complex at Hay Point/Dairymple Bay/Dudgeon Point a capacity of 340Mtpa. These proposals are summarised and fully referenced in Greenpeace's report: Greenpeace Australia Pacific (2012) op cit.
- 104** Greenpeace Australia Pacific (2012) op cit.
- 105** The Australian (2010). Two men in court over coal carrier grounding on Great Barrier Reef. 15 April 2010. <http://www.theaustralian.com.au/news/two-men-in-court-over-coal-carrier-grounding-on-great-barrier-reef/story-e6frg6oo-1225853950429>
- 106** UNESCO World Heritage Committee (2012). Convention concerning the protection of The world cultural and natural heritage – 36th Session, paragraph 5 of decision 7b.8, p26. October 2012. <http://whc.unesco.org/archive/2012/whc12-36com-7badd-en.pdf>

- 107** Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2012). Guidelines for a Public Environment Report for Abbot Point Terminal 0, Terminal 2 and Terminal 3 capital dredging, Queensland. DSEWPaC, Brisbane, Australia. June 2012. http://www.environment.gov.au/epbc/notices/assessments/2011/6213/2011-6213-guidelines_issued.pdf
- 108** Bell I (2003). Turtle Population Dynamics in the Hay Point, Abbot Point and Lucinda Port Areas. Queensland Parks and Wildlife Service, Townsville, Australia. September 2012. http://www.seaturtle.org/PDF/Bell_2003_TurtlePopulationDynamicsintheHayPoi.pdf
- 109** Hancock Coal Infrastructure Pty Ltd (2012). Abbot Point Coal Terminal 3: MNES Preliminary Documentation. September 2012. <http://hancockcoal.com.au/go/current-projects/terminal-3-development-at-the-port-of-abbot-point>
- 110** Poloczanska E et al (2012). Marine Climate Change in Australia Report Card. National Climate Change Adaptation Research Facility and CSIRO Marine and Atmospheric Research. September 2012. http://www.oceanclimatechange.org.au/content/images/uploads/Marine_Report_Card_Australia_2012.pdf
- 111** Ibid.
- 112** The Australia Institute (2012). QLD mining boom to destroy 20,000 non mining jobs, The Australia Institute, September 2012. <https://www.tai.org.au/index.php?q=node%2F19&pubid=981&act=display>
- 113** Ibid.
- 114** Ibid.
- 115** The Australian (2012). Job losses mount to 3500 as coal outlook dims. 11 September 2012. <http://www.theaustralian.com.au/business/mining-energy/job-losses-mount-to-3500-as-coal-outlook-dims/story-e6frg9e6-1226471389527>
- 116** Wall Street Journal 18 Sep 2012. Australia Cuts Forecast for Mining Exports. <http://online.wsj.com/article/SB10000872396390443995604578003031800989710.html>
- 117** Bureau of Resource and Energy Economics (BREE) (2012). Resources and Energy Quarterly: September Quarter 2012. BREE, Canberra, Australia. September 2012. http://bree.gov.au/documents/publications/req/BREE_REQ_Sept2012.pdf
- 118** Frieler K et al (2012). Limiting global warming to 2 °C is unlikely to save most coral reefs. Nature Climate Change, doi:10.1038/nclimate1674. <http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate1674.html#frequency-of-bleaching-at-different-global-warming-levels>
- 119** Sierra Club (2012). As the Climate Warms, US Hits 120 Coal Plants Heading to Retirement. 27 August 2012. <http://sierraclub.typepad.com/compass/2012/08/climate-coal-plants-retirement-.html>
- 120** Assuming gas consumption of 6 l/100km and 30,000km/year/vehicle driven.
- 121** Power TM (2012). The Greenhouse Gas Impact of Exporting Coal from the West Coast. An Economic Analysis. Sightline Institute. <http://www.sightline.org/wp-content/uploads/downloads/2012/02/Coal-Power-White-Paper.pdf>
- 122** Zhuang G et al (2011). The True Cost of Coal. Coal Dust Storms: Toxic Wind. Greenpeace East Asia, Beijing. <http://www.greenpeace.org/eastasia/Global/eastasia/publications/reports/climate-energy/2011/the-true-cost-of-coal-dust-storms-toxic-wind.pdf>
- 123** This statement was found on the website of BNSF on 15 March 2011, but the website has subsequently been modified to include no quantitative information on the amount of dust. An archived version of the website before the modification is found at <http://web.archive.org/web/20110315174444/http://www.bnsf.com/customers/what-can-i-ship/coal/coal-dust.html>.
- 124** See a statement by the local physicians of Whatcom county: Whatcom Docs Position Statement on Coal Shipments to Cherry Point. <http://www.coaltrainfacts.org/whatcom-docs-position-statement-and-appendices>
- 125** The Seattle Times (2012). EPA wants full review of Ore. coal export project. 17 April 2012. http://seattletimes.com/html/localnews/2018002168_apwacoalexportsepa1stldwritethru.html
- 126** The Institute for Energy Economics & Financial Analysis (2012). <http://ieefa.org/ieefa-us-taxpayers-lose-more-than-1-billion-w>
- 127** The Age (2012). China slowdown hits Indonesian coal exporters. 7 September 2012. <http://www.theage.com.au/business/china-slowdown-hits-indonesian-coal-exporters-20120907-25i18.html#ixzz27VbACZJj>
- 128** BP (2012) op cit.
- 129** IEA (2012a) op cit.
- 130** Harrington A & Trivett M (2012). Indonesian Coal Review - The short term option. Patersons Securities, Perth, Australia.
- 131** World Bank (2012c). <http://data.worldbank.org/indicator/NY.GDP.COAL.RT.ZS>
- 132** The value of the 2011 coal output of 325Mt at a free on board price of \$60-80 US dollars was 2.3-3.1% of Indonesia's GDP of \$846.45bn as reported in IMF World Economic Outlook Database, October 2012. <http://www.imf.org/external/pubs/ft/weo/2012/02/weodata/index.aspx>. The planned coal export expansion implies a 5.0% annual growth rate of coal output and the IEA World Energy Outlook 2012 foresees coal prices declining from 2011 levels until 2015, meaning that the added value from coal production will grow slower than output. The IMF projects the Indonesian GDP to grow at 6.0-6.8% a year until 2017, implying a declining GDP share of coal production.
- 133** Cosslett CE & van Paddenburg A (2012). Heart of Borneo: Investing in Nature for a Green Economy. WWF Heart of Borneo Global Initiative. Jakarta, Indonesia. p112.
- 134** Jaringan Advokasi Tambang - Mining Advocacy Network (JATAM) 2010. Deadly Coal, JATAM, Jakarta, Indonesia, p21.
- 135** Cosslett CE & van Paddenburg A (2012) op cit.
- 136** McKinsey Global Institute (2012). The Archipelago Economy: Unleashing Indonesia's Potential. McKinsey & Company, Seoul, South Korea, p61.
- 137** Visit <http://english.jatam.org> to find out more about this local campaign.
- 138** Cosslett CE & van Paddenburg A (2012) op cit.
- 139** McKinsey Global Institute (2012) op cit, p61
- 140** Meindersma W et al (2012) op cit.
- 141** Duffy A (2012). T.M.F World Energy Map: China, Daily Finance, 26 June 2012. <http://www.dailyfinance.com/2012/06/29/china/> Chinese National Bureau of Statistics (2010). China Statistical Yearbook 2010: Energy. National Bureau of Statistics, Beijing, China.

- 142** Chinese National Bureau of Statistics (2010) op cit. Read more at: <http://www.greenpeace.org/eastasia/campaigns/climate-energy/problems/coal/>
- 143** US Energy Information Administration (2012a). China – Analysis. September 2012. <http://www.eia.gov/countries/cab.cfm?fips=CH>
- 144** Meindertsma W et al (2012) op cit.
- 145** Kirkland J (2011). Where Coal Is King in China. *Scientific American*, 4 November 2011. <http://www.scientificamerican.com/article.cfm?id=where-coal-is-king-in-china>
- 146** The Ministry of Science and Technology of the Peoples Republic of China (MOST), China Meteorological Administration (CMA) & Chinese Academy of Sciences (CAS) (2011). Second National Assessment Report on Climate Change, MOST, CMA, CAS, Beijing, China, p263.
- 147** Ibid, p266.
- 148** Ibid, p107.
- 149** Ibid, p111.
- 150** Key Laboratory of Water Circle & Related Land Surface Process, Institute of Geographic Science and Natural Resource Research, & CAS (2012). Thirsty Coal. Greenpeace East Asia, Beijing, China. p65. <http://www.greenpeace.org/china/zh/publications/reports/climate-energy/2012/thirsty-coal/>
- 151** See for example: Cannon KA (2006). Water as a Source of Conflict and Instability in China. http://www.idsa.in/system/files/strategicanalysis_kcannon_0606.pdf
- 152** Larson C (2012). China's looming conflict between energy and water, *Yale 360*, 30 April, 2012. http://e360.yale.edu/feature/chinas_looming_conflict_between_energy_and_water/2522/
- Chan W, Robins N & Knight Z (2012). No Water, No Power, Is there enough water to fuel China's power expansion? HSBC Global Research. September 2012. <https://www.research.hsbc.com/midas/Res/RDV?ao=20&key=Cu58QjJSwz&n=342956.PDF>
- 153** Larson C (2012) op cit.
- 154** Liu S (2009). Consideration on sustainable use of water resources in Shanxi province. *Water Resource Management*, 5: 44-45.
- 155** Larson C (2012) op cit.
- 156** Ding Y & Liu S (2005). Yellow River at Risk, Greenpeace China, Beijing, China.
- 157** Ding Y & Liu S (2005) op cit.
- 158** Wang B, Peng Z & Song W (2007). Analysis, prevention and treatment for Datong City surface water pollution. *Yanbei Teachers College Journal*. 23(2): 57-59.
- 159** Mao YS, Sheng H & Yang FQ (2008). The True Cost of Coal, p2.
- 160** Meindertsma W et al (2012) op cit, p19.
- 161** Hansen J (2012b). Game over for the climate, *New York Times*, 9 May 2012. http://www.nytimes.com/2012/05/10/opinion/game-over-for-the-climate.html?_r=0
- 162** Meindertsma W et al (2012) op cit, p5.
- 163** Stewart K (2012). Harper's Shell Game: Why Tar Sands Pipelines Are Not in Canada's National Interest. Greenpeace Canada, Toronto, Canada. <http://www.greenpeace.org/canada/en/campaigns/Energy/tarsands/Resources/Reports/shellreport/>
- 164** Jones J (2012) Enbridge plans huge Canada, US pipeline expansion, Reuters, 17 May 2012. <http://uk.reuters.com/article/2012/05/17/enbridge-idUKL4E8GH0H820120517>
- 165** Ibid.
- 166** Bloomberg (2012). Keystone XL Pipeline Will Raise U.S. Gasoline Prices, Group Says. 22 May 2012.
- 167** Lewis B, Ljunggren D & Jones J (2012). Canada's Stunning Tar Sands Battle. *Climate Spectator*, 14 May 2012. <http://www.climatespectator.com.au/commentary/canada-s-stunning-tar-sands-battle>
- 168** Greenpeace Canada (2008a). Threats: Water Depletion. September 2012. <http://www.greenpeace.org/canada/en/campaigns/Energy/tarsands/Resources/Fact-sheets/Threats-Water-depletion/>
- 169** Greenpeace Canada (2012a) Tar Sands: Learn About. September 2012. <http://www.greenpeace.org/canada/en/campaigns/Energy/tarsands/Learn-about/>
- 170** Ibid.
- 171** Greenpeace Canada (2012b) Tar Sands. September 2012. <http://www.greenpeace.org/canada/en/campaigns/Energy/tarsands/>
- 172** Agency for Toxic Substances and Diseases Registry (ATSDR) (1996). Toxic Substances Portal – Polycyclic Aromatic Hydrocarbons. June 2012. <http://www.atsdr.cdc.gov/toxfaqs/faq.asp?id=121&tid=25>
- 173** Greenpeace Canada (2008b). Threats: Social Costs. September 2012. <http://www.greenpeace.org/canada/en/campaigns/Energy/tarsands/Resources/Fact-sheets/Threats-Social-costs/>
- 174** Ibid.
- 175** Ibid.
- 176** Alberta Energy (2012). Oil Sands. Facts and Statistics <http://www.energy.alberta.ca/oilsands/791.asp>
- 177** Oil Sands Developers Group (2012). Oil Sands Project List. January 2012. <http://www.oilsandsdevelopers.ca/wp-content/uploads/2012/01/Oil-Sands-Project-List-January-2012.pdf>
- 178** Brown G, Moorhouse J & Grant J (2009). Opening the Door For Tar Sands Expansion. Pembina Institute, Alberta, Canada. p9.
- 179** Stewart K (2012) op cit.
- 180** IEA (2012). CO₂ Emissions from Fuel Combustion 2012.
- 181** D'Andrea WJ et al (2012). Mild Little Ice Age and unprecedented recent warmth in an 1,800 year lake sediment record from Svalbard. *Geology*, doi:10.1130/G33365.1
- Arctic Climate Impact Assessment (ACIA) (2004). Impacts of a warming Arctic. ACIA, Cambridge University Press, Cambridge, United Kingdom. <http://www.acia.uaf.edu/pages/overview.html>
- Ford JD & Furgal C (2009). Climate change impacts, adaptation and vulnerability in the Arctic. *Polar Research*. 28(1), 1-9.
- 182** Stroeve JC et al (2012). The Arctic's rapidly shrinking sea ice cover: a research synthesis. *Climatic Change* 110(3–4):1005–1027.

- 183** US Geological Survey (2008). 90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic. September 2012. <http://www.usgs.gov/newsroom/article.asp?ID=1980#.T7Yd4u0tw20>; Global oil consumption is 77 mbd; IEA 2012. World Energy Outlook.
- 184** Ibid.
- 185** Cutler RM (2011). Exxon wins BP's lost Russian Arctic fields. Asia Times. 1 September 2011. http://www.atimes.com/atimes/Central_Asia/M101Ag01.html
- 186** AFP (2012). Oil Spilled in Russian Arctic, AFP, 23 April 2012. <http://www.google.com/hostednews/afp/article/ALeqM5jJGmuaVhiaGo3XpX6RhCGpo0Kw6g?docId=CNG.82f99a6e478d920f9407dc666cba263e.da1>
- 187** Ayliffe B (2011). Arctic lightning strikes yet again as Cairn Energy strikes, er, nothing. Greenpeace International. October 2012. <http://www.greenpeace.org/international/en/news/Blogs/makingwaves/arctic-lightning-strikes-yet-again-as-cairn-e/blog/38130/>
- 188** Owens B (2012). Barge damage forces Shell to abandon drilling in Arctic sea. Nature News Blog. May 2012. <http://blogs.nature.com/news/2012/09/barge-damage-forces-shell-to-abandon-drilling-in-arctic-sea.html>
- 189** Goldenberg S (2010). Arctic oil spill clean-up plans are 'thoroughly inadequate', industry warned. The Guardian. 11 November 2010. <http://www.guardian.co.uk/environment/2010/nov/11/arctic-oil-spill-plans>
- 190** Kenny C (2011). To plunder or protect the Arctic? The Star, 16 September 2011. <http://www.thestar.com/opinion/editorialopinion/article/1055467--to-plunder-or-protect-the-arctic>
- 191** McCarthy S (2011). Oil giants contest Arctic relief well requirement, The Globe and Mail, 5 April 2011. <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/oil-giants-contest-arctic-relief-well-requirement/article1972323/>
- 192** National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. 2011. Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling. May 2012. <http://www.oilspillcommission.gov/>
- 193** Reuters (2011). Arctic oil spill would challenge US Coast Guard. Reuters, 20 June 2011. <http://af.reuters.com/article/energyOilNews/idAFN1E75J1OG20110620?sp=true>
- 194** Platts (2011). US not ready to respond to Arctic oil spills: Coast Guard chief. 27 July 2011. <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Oil/632009>
- 195** US Fish and Wildlife Service (2010). Alaska Maritime National Wildlife Refuge: Overview. <http://www.fws.gov/refuges/profiles/index.cfm?id=74500>
- 196** Barrett PM & Millard P (2012) op cit.
- 197** IEA (2012a) op cit.
- 198** US Energy Information Administration (2012b). Brazil – Analysis. September 2012. <http://www.eia.gov/countries/cab.cfm?fips=BR>
- 199** Barrett PM & Millard P (2012) op cit.
- 200** Wheatley J (2010). Brazil unlikely to be deterred from deepwater riches. Financial Times. 16 June 2010. <http://blogs.ft.com/energy-source/2010/06/16/petrobras/#axzz1v14coFq>
- 201** Ibid.
- 202** Millard P (2010). Oil-Rich Deep Waters Off Brazil Still Beckon. Business Week. 10 June 2010. http://www.businessweek.com/magazine/content/10_25/b4183016341730.htm
- 203** Jacquot JE (2007). Will Brazil's New Oil Find Slow Progress on Biofuels? Treehugger. 2 December 2007. <http://www.treehugger.com/corporate-responsibility/will-brazils-new-oil-find-slow-progress-on-biofuels.html>
- 204** Kolian S (2011). Gulf Divers Experiencing Health Problems, Blood Contaminated With Petroleum Hydrocarbons. Ecorigs, Los Angeles. <http://mrk.org/issues/bp-s-deep-water-drilling-disaster/gulf-divers-experiencing-health-problems-blood-contaminated-with-petroleum-hydrocarbons.html>
- 205** USA Today (2010). Memorial service honors 11 dead oil rig workers. http://usatoday30.usatoday.com/news/nation/2010-05-25-oil-spill-victims-memorial_N.htm
- 206** PBS (2010). New Estimate Puts Gulf Oil Leak at 205 Million Gallons. <http://www.pbs.org/newshour/run-down/2010/08/new-estimate-puts-oil-leak-at-49-million-barrels.html>
- 207** Barrett PM & Millard P (2012) op cit.
- 208** Messenger S (2011). Chevron's Drilling Rights in Brazil Suspended After Spill, Treehugger, 24 November 2011. <http://www.treehugger.com/corporate-responsibility/chevrons-licene-drill-brazil-suspended-after-spill.html>
- 209** Dittrick P (2012). Brazilian prosecutors file criminal charges against Chevron, Transocean execs, Oil and Gas Journal. 26 March 2012. <http://www.ogj.com/articles/print/vol-110/issue-3c/general-interest/brazilian-prosecutors.html>
- 210** Messenger S (2011) op cit.
- 211** IEA (2011) op cit, p618.
- 212** IEA (2011) op cit.



GREENPEACE

Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands

[greenpeace.org](https://www.greenpeace.org)

APPENDIX 47



SPOKANE CITY COUNCIL
808 W. Spokane Falls Blvd.
Spokane, WA 99201-3335
(509) 625-6255

Ben Stuckart
Council President

March 26, 2013

Chairman Daniel R. Elliott III
Surface Transportation Board
395 E. Street, SW
Washington, D.C. 20423

Re: Finance Docket No. 30186

Chairman Elliott,

I am writing in regard to the Tongue River Railroad (TRR) permit application. I write from Spokane, WA, where I serve as *President of the City Council*. I am concerned about the potential effects the proposed railroad would have on my town, and communities like it.

Spokane is bisected by train tracks that would see increased coal train traffic as a result of the proposed TRR. The Tongue River Railroad would be built to serve the proposed strip mine at Otter Creek. Arch Coal, the mine's owner, has stated the mine would be developed to export coal to Asian markets. As the proposed Pacific Northwest ports would seem to be the most economically viable way to export the coal, the Tongue River Railroad would directly lead to increased coal train traffic through Spokane.

Increased coal traffic would lead to more noise and air pollution, as well as traffic congestion. *The railroad has at grade crossings on many of our major freight routes and our downtown overpasses are overused.* The effects of this traffic would be compounded by current and proposed additional coal shipments through our town, leading to even larger cumulative effects, which need to be analyzed.

The Surface Transportation Board (STB) should therefore analyze and seek to mitigate the coal traffic impacts caused by the Tongue River Railroad from the mine site all the way to the west coast. Further, as an agent of federal rail oversight, the STB ought to also conduct a cumulative analysis of the impacts of all rail traffic to service the proposed west coast ports. The cumulative effect of increased traffic on the rail system needs to be looked at and addressed.

I swear under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge.

Sincerely,

A handwritten signature in black ink that reads "Ben Stuckart".

Ben Stuckart
City Council President

APPENDIX 48



March 31, 2013

Chairman Daniel R. Elliott III
Surface Transportation Board
395 E. Street, SW
Washington, D.C. 20423

Re: Finance Docket No. 30186

Chairman Elliott,

I am writing in regard to the Tongue River Railroad (TRR) permit application. I write from Sumner, Washington where I serve as a City Councilmember. I am concerned about the potential effects the proposed railroad would have on my town and communities like it.

Sumner, WA is bisected by four at grade, two grade separated and one private train track that would see increased coal train traffic as a result of the proposed TRR. The Tongue River Railroad would be built to serve the proposed strip mine at Otter Creek. I've observed that Arch Coal, the mine's owner, has stated the mine would be developed to export coal to Asian markets. As the proposed Pacific Northwest ports would seem to be the most economically viable way to export the coal, the Tongue River Railroad would directly lead to increased coal train traffic through Sumner.

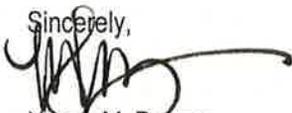
Increased coal traffic would lead to more noise and air pollution, as well as traffic congestion. *Sumner's is concerned that increased coal traffic may :*

- Decrease the ability to provide emergency services when critical access points are blocked
- Cause a greater risk of pedestrian and auto accidents at our at grade crossings
- Potentially could cause a loss of jobs in our industrial north end (employs 10,000+ in a city of 9500 residents) and loss of competitiveness for future jobs in areas subjected to the delay, noise and other impacts associated with increased rail traffic
- Create a diseconomy when downtown businesses are cut off by mile long trains
- Exacerbate health impact of residents subjected to coal dust, increased emissions not only from train engines but from cars and trucks idling at crossing and the health effects of chronic noise from trains

At present, Sumner experiences 3-5 full coal trains traveling through Sumner each day northbound to Canada and 2-5 empty coal trains traveling through Sumner from Centralia to go over Stevens Pass. The effects of the increased coal traffic would be compounded by current and proposed additional coal shipments through our town, leading to even larger cumulative effects, which need to be analyzed.

The Surface Transportation Board (STB) should therefore analyze and seek to mitigate the coal traffic impacts caused by the Tongue River Railroad from the mine site all the way to the west coast. Further, as an agent of federal rail oversight, the STB ought to also conduct a cumulative analysis of the impacts of all rail traffic to service the proposed west coast ports. The cumulative effect of increased traffic on the rail system needs to be looked at and addressed.

I swear under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge.

Sincerely,

Nancy M. Dumas
City Councilmember

SUMNER CITY COUNCIL

1104 Maple Street, Suite 200
Sumner, WA 98390
253-299-5794

Nancy Dumas
Councilmember

APPENDIX 49



City Council Office

435 Ryman

Missoula, MT 59802

Phone: 406-552-6079

Fax: 406-327-2137

E-mail: council@ci.missoula.mt.us

Web: www.ci.missoula.mt.us/citycouncil/

March 29, 2013

Chairman Daniel R. Elliott III
Surface Transportation Board
395 E. Street, SW
Washington, D.C. 20423

Re: Finance Docket No. 30186

Dear Chairman Elliott,

We are writing to you today regarding the Tongue River Railroad (TRR) permit application. All signatories serve on the Missoula City Council, two representing the 10,000 residents of Ward 1—an area of Missoula, Montana, that is bisected by the BNSF-MRL mainline. As elected representatives of our community, we're very concerned about the potential impacts of increased coal train traffic through the heart of our community. Therefore, on behalf of our constituents, we respectfully request that you examine all downline impacts that will result from the construction of the TRR, from the Powder River Basin/Otter Creek coal deposits in southeast Montana to the proposed coal export facilities in Oregon and Washington

The railroad tracks and railyard in Missoula cut through a significant portion of town. When blocked, the crossing at Greenough Drive effectively cuts off one of two routes into downtown from the Lower Rattlesnake neighborhood. The increased train traffic will cause much more frequent delays there and will result in significant additional emissions of air pollutants, including greenhouse gases, from numerous cars idling for additional hours per day. The Greenough Drive/Madison Street Crossing

is an at-grade crossing at which locomotives are required to blast their horns. Increased train traffic will significantly increase the amount of noise that our constituents must endure every day. Finally, increased diesel exhaust and impacts from coal dust emissions should also be thoroughly analyzed, as both have been shown to negatively impact public health, particularly women's health.

The mainline through Missoula bisects some of our community's lowest income neighborhoods, so not only should environmental impacts be analyzed, but the social justice and environmental justice impacts caused by increased Powder River Basin coal train traffic should also be examined.

Not only should the STB analyze all downline, cumulative impacts from increased coal train traffic caused by the construction of the TRR, but it should require mitigations. We don't believe that our constituents should shoulder the burden for mitigating impacts foisted upon us, and the STB, as the federal regulatory agency with jurisdiction to both examine area-wide impacts and require mitigations, must play a key role in helping communities, like Missoula, address potential coal train impacts. Thanks for considering our comments.

Sincerely,



Dave Strohmaier
Chair, Conservation Committee
Missoula City Council, Ward 1



Jason Wiener
Chair, Public Works Committee
Missoula City Council, Ward 1



Caitlin Copple
Chair, Economic Development Subcommittee
Missoula City Council, Ward 4

APPENDIX 50

Montana State Senate



SENATOR CHRISTINE KAUFMANN
HELENA

HELENA ADDRESS:
PO BOX 200500
HELENA, MONTANA 59620-0500
(406) 444-4800

March 30, 2013

The Big Sky Country

HOME ADDRESS:
PO BOX 1566
HELENA, MONTANA 59624-1566
(406) 439-0256
kaufmann@mt.net
www.ckaufmann.com

Chairman Daniel R. Elliott III
Surface Transportation Board
395 E. Street, SW
Washington, D.C. 20423

Re: Finance Docket No. 30186

Chairman Elliott,

I am writing in regard to the Tongue River Railroad permit application. I write from Helena, Montana where I serve as a state senator on the Natural Resources Committee and the Energy and Transportation Committee. I am concerned about the potential effects the proposed railroad would have on my town, and communities like it.

Helena is bisected by train tracks that would see increased coal train traffic as a result of the proposed Tongue River Railroad which would be built to serve the proposed strip mine at Otter Creek. Arch Coal, the mine's owner, has stated the mine would be developed to export coal to Asian markets. As the proposed Pacific Northwest ports would seem to be the most economically viable way to export the coal, the Tongue River Railroad would directly lead to increased coal train traffic through Helena.

Increased coal traffic would lead to more noise, air pollution and traffic congestion. My constituents already complain about long waits for trains and express concerns about delay of emergency services. The effects of this traffic would be compounded by current and proposed additional coal shipments through our town, leading to even larger cumulative effects, which need to be analyzed.

The Surface Transportation Board (STB) should therefore analyze and seek to mitigate the coal traffic impacts caused by the Tongue River Railroad from the mine site all the way to the west coast. Further, as an agent of federal rail oversight, the STB ought also conduct a cumulative analysis of the impacts of all rail traffic to service the proposed west coast ports. The cumulative effect of increased traffic on the rail system needs to be looked at and addressed.

Sincerely,

Senator Christine Kaufmann
825 Breckenridge Street
Helena Montana

I swear under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge.

APPENDIX 51

March 31, 2013

Mr. Daniel R Elliott III
Chairman, Surface Transportation Board
395 East Street SW
Washington, D.C. 20423

Re: Finance Docket No. 30186

Dear Mr. Elliott,

I am writing in regard to the Tongue River railroad permit application. The City of Livingston, Montana, population 7,500, is bisected by the southern main line of the Montana Rail Link/Burlington Northern Santa Fe railroad companies. The development of ports on Washington's coast will have an impact upon the City of Livingston by increasing train traffic. The Livingston City Commission has through a majority vote of its members requested that the Army Corps of Engineers expand the scope of its Environmental Impact Study for said ports to include an analysis of effects to the City of Livingston. As a member of the City Commission I voted to approve the request to the Army Corp, and as a citizen I believe increased rail traffic will have profound effects on Livingston, effects which should be thoroughly investigated.

Increasing the number of trains through Livingston will exacerbate three issues currently facing Livingston, including 1. reduced access, 2. additional noise, and 3. potential health concerns from exhaust and coal dust.

1. Access. As the City is bisected by the rail line, three railroad crossings, two at grade, and one underpass serve as access points. These crossings are currently stressed with re-routing and congestion issues. Increased traffic will in turn increase access issues for citizens, businesses and emergency response vehicles.

2. Noise. Many citizens are currently impacted by train and whistle noise due to the central location of the rail line. Residents of Livingston have expressed considerable distress over potential increases in train noise from increased rail traffic.

3. Potential Health Hazards. Increased health hazards such as exhaust from increased idle time from waiting motor vehicles, increased diesel exhaust from the trains themselves, and coal dust from moving trains are a concern for Livingston.

Please consider this request to address the impact of the development of Washington ports and associated increases to rail traffic on the City of Livingston, and indeed along the entire rail line. In particular, I am requesting that the Surface Transportation Board analyze potential impacts from increased rail traffic caused by the Tongue River Railroad.

Please feel free to contact me with any questions or comments, and thank you for your time.

Sincerely,



Adam Stern

Livingston City Commissioner
208 South F Street
Livingston, MT 59047
(406) 224-1875
adam@commissioneradamstern.org
www.commissioneradamstern.org
www.livingstonmontana.org

I swear under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge.

Adam Stern, March 31, 2013

APPENDIX 52

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

Finance Docket No. 30186

**TONGUE RIVER RAILROAD COMPANY, INC. – RAIL CONSTRUCTION
AND OPERATION – IN CUSTER, POWDER RIVER AND
ROSEBUD COUNTIES, MT**

**VERIFIED STATEMENT OF
STEVAN B. BOBB**

My name is Stevan B. Bobb. Since December 2011, I have been President of Tongue River Railroad Company, Inc. ("TRRC"). I also am the recently appointed Executive Vice President and Chief Marketing Officer for BNSF Railway Company ("BNSF"). My previous position at BNSF was Group Vice President, Coal Marketing. I joined BNSF's predecessor, the Burlington Northern Railroad, in 1987 and have been employed continuously by the railroad since that date. Following some early work in information systems and marketing support, my career has been spent primarily in line marketing positions. I have a B.S. in Agriculture from North Dakota State University.

Since becoming President of TRRC, I have been involved in the general oversight of the Tongue River Railroad project. Based on my experience in my current position, I am very familiar with the transportation of coal by rail and specifically with the need for the TRRC line for transporting the substantial reserves of Northern Powder River Basin coal mined at Otter Creek and potentially elsewhere in the Ashland area of southeastern Montana.

I. TRRC Plans to Construct Colstrip Alignment

TRRC currently intends to construct and operate an approximately 42-mile line between Colstrip, MT and south of Ashland, MT with two termination points – one that proceeds up the Tongue River Valley to the previously proposed Montco Mine (“Terminus Point 1”) and the other that extends up the Otter Creek drainage (“Terminus Point 2”). TRRC does not intend to construct any rail line south of Terminus Point 1. In other words, TRRC is not proposing to construct the rail line that was the subject of its applications in the TRRC II¹ and TRRC III² proceedings.

TRRC’s current proposed rail line is generally referred to as the Colstrip Alignment because it will result in traffic being routed through Colstrip, MT and will connect with BNSF’s Colstrip Subdivision. It follows a different route than the Miles City, MT to Ashland/Otter Creek alignment proposed in TRRC’s October 16, 2012 Revised Application. TRRC has now chosen this different route for its preferred alignment based on additional engineering and other data that show that the Colstrip Alignment offers an operationally feasible, cost-effective and less environmentally impactful routing for the rail line. Notably, the Colstrip Alignment will require only 42 miles of new construction, as opposed to more than twice that amount of new rail construction for the route through Miles City previously approved by the ICC in the TRRC I proceeding, and almost twice that amount for the modified version of the Miles City route offered by TRRC in its October 16, 2012 application.

¹ The TRRC II proceeding is Finance Docket No. 30186 (Sub-No. 2), *Tongue River Railroad Company – Rail Construction and Operations – Ashland to Decker, Montana*.

² The TRRC III proceeding is Finance Docket No. 30186 (Sub-No. 3), *Tongue River Railroad Company, Inc – Construction and Operation – Western Alignment*.

The northern end of the Colstrip Alignment will connect to the existing BNSF Colstrip Subdivision just south of Colstrip, MT. The BNSF Colstrip Subdivision would connect TRRC's Colstrip Alignment to BNSF's Forsyth Subdivision at Nichols Wye, from which location trains can move either eastbound or westbound on the Forsyth Subdivision. Apart from an occasional local train, the existing BNSF Colstrip Subdivision is not used for regular train service today. Thus, the operation on that Subdivision of trains originating or terminating on the TRRC Colstrip Alignment will not result in any train conflicts or otherwise overburden the Colstrip Subdivision line. The Colstrip Subdivision and the Nichols Wye will, however, require some upgrading to meet current main line standards for track handling unit trains of coal. Such upgrades will be made before TRRC-originating unit coal trains will use the line.

The proposed Colstrip Alignment rail line follows a route that is very similar to the Colstrip Alternative analyzed previously in the TRRC I proceeding.³ From the connection point with the existing BNSF Colstrip Subdivision south of Colstrip, the new line would head generally southeast, crossing and paralleling existing State and County roads to the Tongue River valley at a point about nine miles north of Ashland. From there, the line would turn generally south and east of Ashland and then split into two branches just south of Ashland with two end points described above – Terminus Point 1 and Terminus Point 2. The primary difference between the Colstrip Alignment now being proposed and the Colstrip route considered previously in the TRRC I case is that approximately five miles of the Alignment would now parallel Greenleaf Road (S-447) prior to reaching the Tongue River valley, rather than following Roe & Cooper Creek. By taking advantage of the existing Greenleaf Road corridor, as opposed to creating a new corridor for that approximate five mile distance, it is anticipated that there will

³ The TRRC I proceeding is Finance Docket No. 30186, *Tongue River R.R. – Rail Construction and Operation – In Custer, Power River and Rosebud Counties, MT.*

be fewer adverse environmental impacts, including fewer disruptions to agricultural and ranching operations in the area.

From approximately nine miles north of Ashland to Terminus Points 1 and 2, the proposed Colstrip Alignment closely matches the alignment of the TRRC rail line previously approved by the ICC in 1986 in the TRRC I proceeding,⁴ except for some refinements now proposed to that portion of the line. Those refinements, which are the same as those proposed for the Ashland-Terminus Points 1 and 2 portion of the line in TRRC's October 16, 2012 application, are reflected in the alignment shown on the map attached in Exhibit C to TRRC's current application and are also reflected on the detailed aerial photos that are attached to this application as part of Exhibit C. The refinements generally entail a straightening and shortening of the rail alignment approved in 1986. Some of these refinements had previously been proposed by TRRC and were considered in the TRRC III proceeding.

II. There is a Public Need for the TRRC Line

The common carrier TRRC line as now proposed would serve the same public need as the line approved by the ICC in 1986. Specifically, the line will allow for the transportation of coal produced at the Otter Creek Mine that is planned for development by Otter Creek Coal, L.L.C. a subsidiary of Arch Coal, Inc. ("Arch"). It will also allow for the transportation of coal from other mines that may be developed in the Ashland area and other products that may be transported by any shippers that choose to utilize the line. Because the TRRC line will be operated as a common carrier line, TRRC will hold itself out to transport freight for any shipper that locates on the line and makes a reasonable request for rail service, just as BNSF does.

⁴ Finance Docket No. 30186, *Tongue River R.R. – Rail Construction and Operation – In Custer, Power River and Rosebud Counties, MT* (ICC served May 9, 1986) (hereafter "1986 Decision").

The rail transportation of coal produced at the Otter Creek Mine and other mines that may be developed in the area would no less serve the public convenience and necessity than do the numerous rail lines that serve existing coal mines in other portions of the Powder River Basin today. Such transportation is critical to meeting energy needs, to the financial health of the coal industry and to the economy of eastern Montana. In fact, there is no viable alternative means of transporting coal in the volumes that will be produced at the Otter Creek mine, other than rail and no rail line other than the TRRC line will be capable of transporting the coal produced in the Otter Creek and Ashland areas of the Northern Powder River Basin. The transportation need for the TRRC line is thus obvious, and verified by the decisions of TRRC's owners, including BNSF and Arch, to invest in the development of this rail line.

The State of Montana has already demonstrated its commitment to the development of the substantial coal resource at Otter Creek through its decision to lease the Otter Creek tracts to an affiliate of Arch. The lease payments and other income that the State will earn from the development of the coal resource will result in large payments to the State that will enhance the State's ability to fund important public needs.

Moreover, Arch's actions in taking important steps to seek a permit for the Otter Creek mine underscore its belief that there is a market for the coal to be mined at that site. There are approximately 1.5 billion tons of low sulfur, sub-bituminous coal located in the Otter Creek area, making it one of the largest undeveloped coal fields in the United States. There are several billion tons of coal overall in the Ashland area. For that reason, TRRC is proposing to build its line not only to Otter Creek, but also to Terminus Point 1, so that TRRC will be positioned to transport coal that may be mined in the Ashland area.

Coal remains an important energy resource and its role in that regard will remain vital for years to come. Accordingly, the owners of TRRC, which include BNSF and Arch, are prepared to make a significant financial investment in the TRRC line to complement the investment that Arch is making in the development of the Otter Creek mine. These investments underscore the need for the TRRC line and for the coal that would be transported on the line.

III. Colstrip Alignment Has Environmental, Economic and Operating Advantages Over Rail Line Approved by ICC in 1986

I describe below some of the environmental, economic and operating benefits that will result from constructing the TRRC line along the Colstrip Alignment rather than along an alignment between Miles City and Terminus Points 1 and 2, as approved by the Interstate Commerce Commission ("ICC") in 1986.

A. Environmental Advantages

The Colstrip Alignment will be approximately 46 miles shorter than the route previously approved by the ICC in the TRRC I proceeding. As a result, the Colstrip Alignment will require fewer acres of land to be acquired for the railroad right-of-way and, consequently, fewer acres of vegetation and wildlife habitat will be lost if the Colstrip Alignment is constructed in lieu of the rail line approved in 1986.

The Colstrip Alignment also has the advantage over the previously approved route of following existing corridors. Moreover, the Colstrip Alignment has the environmental advantage over other routings considered previously in TRRC I of reducing the number of railroad miles traversing the Tongue River valley. Heading south from its northern terminus at the existing BNSF Colstrip Subdivision south of the town of Colstrip, the Alignment would enter the Tongue River valley near the point where Greenleaf Road intersects with Tongue River Road, and traverse the valley for a distance of only about 17 miles to Terminus Point 1. Thus, potential

impacts to the valley and to the Tongue River, including water quality impacts, very likely would be reduced relative to the Miles City route.

Further, the modifications proposed to the portion of the Colstrip Alignment that was previously approved by the ICC in 1986 (the portion south of the Greenleaf Road area) locates the line further west of the Tongue River and, as a result, impacts to the river valley will be reduced.

Moreover, unlike the previously approved route, the Colstrip Alignment also completely avoids the Miles City Fish Hatchery and the United States Department of Agriculture's Livestock and Range Research Station ("LARRS") facility. It also eliminates the need for a new crossing of Interstate Highway 94.

B. Economic and Operating Advantages

Operations over the Colstrip Alignment will not require a different number of locomotives than would be the case for any of the other alternatives being considered in the TRRC I proceeding. Further, the Colstrip Alignment will be designed to efficiently handle unit trains of coal.

The Colstrip Alignment will require longer operations against ruling grade (about 12 miles) as opposed to the other alternatives previously considered in the TRRC I proceeding and the modified version of that Miles City route identified in TRRC's October 16 filing. However, the overall shorter distance of the combined Colstrip Alignment/existing BNSF Colstrip Subdivision routing between Otter Creek and the BNSF Forsyth Subdivision will offset to some extent the longer distance of such against-grade operations. Moreover, we have determined that transportation of unit coal trains along the Colstrip Alignment is operationally feasible. In fact,

the operating characteristics of the Colstrip Alignment are not markedly different from those of other lines operated by BNSF that haul coal unit trains.

For Otter Creek/Ashland coal traffic heading westbound, the Colstrip Alignment's general northwest/southeast orientation offers a reduction in the total mileage from origin to ultimate destination for the coal, eliminating approximately 50 miles that the traffic would otherwise have to travel on the existing BNSF Forsyth Subdivision if that traffic entered that Subdivision at or near Miles City as it would under the other alignments previously considered. Eastbound coal traffic would ultimately travel about 38 miles farther under the Colstrip Alignment to reach Miles City, as opposed to the other routes previously considered.

The proposed modifications to the portion of the Colstrip Alignment in the Tongue River valley and along the Otter Creek spur, *i.e.*, the portion of the line south of Greenleaf Road that was previously approved by the ICC, are designed to straighten the line and thereby improve the efficiency of coal unit train operations. This will result in fuel usage, operational cost and maintenance cost benefits relative to the somewhat curvier line previously approved.

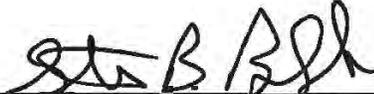
TRRC will finance the construction of the line through equity contributions by some or all of the members of its parent company, Tongue River Holding Company, LLC, or through long-term debt guaranteed by some or all of those members, or through some combination thereof. Due to its shorter length, the cost of constructing the Colstrip Alignment is expected to be meaningfully lower than the cost of constructing any of the proposed alignments through Miles City and well within the ability of the funding parties. The projected construction cost is \$416 million and detail on this cost is provided in Appendix B to the Application.

Further, our projections show that, based on payments made to it by the operator (BNSF) and anticipated expenses, TRRC will be financially viable, as indicated in Exhibit G to the

Application It is planned that the operator will pay the maintenance and insurance costs of the line, and that TRRC's primary expenses will consist of depreciation, property taxes and various administrative expenses

VERIFICATION

I, Stevan B Bobb, hereby verify under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.



Stevan B Bobb

Dated this 14 day of December, 2012