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# Regulating the Environmental Impacts of Alberta's Tar Sands

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# Regulating the Environmental Impacts of Alberta's Tar Sands[1]

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***Draft paper.[2] Comments are welcomed at avc3@cornell.edu or at avcarter@mun.ca.***

Alberta's tar sands embody a central contemporary tension between the need for oil, a fundamental global commodity, and the environment, which is put at risk along the entire oil production chain, from exploration to consumption. The surge in "unconventional" oil projects over the last decade signals a significant shift in global oil production from relatively accessible conventional reserves to "frontier" oil that is farther North, farther offshore, and in ever more fragile landscapes, with ecological impacts increasing in scale, intensity and duration. Alberta's tar sands both encapsulate this fundamental conflict of our time while also foreshadowing the future of oil development.

Of course, a major underlying force at work in the tar sands is the drive for American energy security.[3] Albertan tar sands currently represent approximately 8% of U.S. oil imports and this is predicted to rise as high as 36% by 2030. Rough estimates put the percentage of Albertan bitumen flowing to the American market at 70% with a recent Cambridge Energy Research Associates report indicating that expanded tar sands production has been the "main driver in making Canada the largest supplier, by far, of

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[2] This paper is currently under review for inclusion in *First World Petro-Politics: The Political Ecology of Alberta*, edited by L. Adkin, B. Miller, N. Krogman and R. Haluza-Delay.

[3] For a landmark report on this point, see McCullum (2005).

foreign oil to the United States." Dramatic increases in this unconventional production—which more than doubled from 0.6 million barrels per day in 2000 to 1.35 million barrels per day in 2009—filled the gap left by conventional oil production declines and then "boosted US imports of Canadian crude oil from 1.4 mbd to 1.9 mbd in that time frame" (The Role of Canadian Oil Sands in US Oil Supply 2010, 1, 19). Environmental impacts and regulation in the tar sands are, therefore, directly and intimately tied to American demand for a substantial, stable and proximate oil supply.

This paper examines one aspect of the oil/environment tension—the environmental regulatory system surrounding the tar sands—and attempts to explain trends with reference to broader economic and political struggles. Using a political ecology framework of analysis briefly outlined in the next section, I survey the most pressing environmental impacts of tar sands developments and briefly note who bears these impacts. I then outline the main trends in environmental regulation which permit, or do not prevent, these outcomes. These include a delayed and ineffective positioning of environmental consideration in the approval processes, important regulatory gaps or inadequacies relating to carbon emissions, freshwater extraction, reclamation and public consultation, and analytical weaknesses regarding cumulative impacts. I account for the province's regulatory approach in relation to "petro-politics," or the specific form of Alberta's "petro-polity."

A petro-state is defined by high dependence[4] on oil resulting in a particular set of political-economic challenges captured in the "resource curse" concept. Literature in this vein demonstrates correlations between high dependence on natural resources, impacts that are particularly exaggerated in oil-based states, and economic and political trends. Multiple studies confirm the negative long-term economic impacts of natural resource dependence generally and oil dependence in particular (Auty 1993; Gelb 1988; Humphreys, Sachs, and Stiglitz 2007; Nankani 1979; Neumayer 2004; Sachs and Warner 1999; Wheeler 1984), including declining per-capita GDP over time, the export of development benefits (as the industry is often dominated by foreign investment by multinational corporations that do not reinvest profits into the region of extraction), and risks to other key economic sectors (the "Dutch Disease," where instead of invigorating other industries, the oil sector tends to inhibit them by increasing general production costs and drawing labour away from manufacturing and agricultural industries—oil developments have a tendency to choke off other industries). General economic volatility is also a key problem: oil-dependent states are at the mercy of booms and busts associated with unpredictable oil prices.

These economic challenges are mirrored by political challenges that, I argue, have policy consequences in Alberta. In *The Paradox of Plenty*, Karl developed the idea of the "petro-state" which tends to become a rentier state that replaces "statecraft"

[4] The common threshold of "high dependence" is when oil represents one third of exports, GDP or government revenues (Atkinson and Hamilton (2003), Goldberg, Wibbels, and Mvukiyche (2005), Ross (2001), Sachs and Warner (1995, 1999, 2001), Stevens (2003), and Weinthal and Jones Luong (2006)).

with spending (1997, 16), see also Chaudry (1997). The shift from dependence on taxes to dependence on resource rents, and the coinciding changes in political institutions (for instance, the erosion of a strong, broad-based tax system), alters governments' accountability to citizens and citizens' engagement with the state. Then, when oil revenues are disrupted or lower than anticipated, as during the recent decline in oil prices, the state cannot draw on the now eroded tax revenue and instead must cut social services or spending. Karl also showed that economic growth based on resource dependence has long term institutional "inertia" effects that keep the state focused on oil rather than working for diverse (and more resilient) development. Resource rents empower and maintain the power of certain social groups that impede growth and diversification. Wasting of the resource rent is also common: instead of saving the windfalls from natural resources, state actors often act irrationally in response to the "feeding frenzy" pressures from citizens, corporations, and other "rent seekers" (Weinthal and Jones Luong 2006, 39). Corruption and overspending on projects of only short-term value are frequent.

Key data substantiating many of these arguments were provided by Ross (2001) in his analysis of the impact of oil on democracy in 113 states from 1971 to 1997. He found a correlation between oil dependence and authoritarianism and concluded that oil has a tendency to "hurt democracy" (356). Similarly, Jenson and Wantchekon (2004) analyzed the political impact of resource dependence in African states, finding that countries more dependent on natural resources were also "more likely to be authoritarian" and more likely to have "worse governance" (817).

Although resource curse research has long been focused on developing, nation state cases, the findings have been confirmed in developed state cases and at subnational levels of governance in federal states. For example, Goldberg et. al. (2005), show that dependence on natural resource wealth has a "conservative" effect on American states' politics: actors in power at the time resource wealth reaches the state gain the resources to stay in power and retain the economic, political, and social status quo, thereby decreasing party competitiveness. Similarly, the resource curse concept can be extended into Canadian subnational governments. See, for example, Nikiforuk's analysis of Alberta's petro-state qualities (2008, chapter 12).

But how does understanding Alberta as a petro-polity inform an analysis of *environmental policy*, the issue at hand? Karl noted that the "institutional molding brought about by dependence on petrodollars is so overwhelming in oil-exporting countries that their states can appropriately be labelled *petro-states*" (1997, 16, original emphasis). It is this "institutional molding" that is highly relevant in Albertan environmental policy—and this paper argues Alberta's petro-politics has resulted in a weakened environmental policy system that cannot mitigate against even the worst ecological impacts of the tar sands.

Alberta's "petro-political" system is marked by a symbiotic relationship between governments and oil companies, with governments highly dependent on revenues from private oil developments and oil companies earning impressive profits from extraction on public lands. The provincial (and also federal) government ensures the continuation of the industry via funding or subsidies, by actively defending and promoting the

industry at home and abroad, by being reluctant to dig deeper into the environmental questions raised, and by not intervening to protect the environment where regulatory authority exists. Then the tar sands industry reinforces these governmental approaches via coordinated lobbying efforts, political financing, and media and community public relations campaigns. I argue that, driven by its single-minded prioritization of hydrocarbon extraction as an economic "strategy" for the province, and pressured and influenced by a powerful, globally-integrated industry, the Albertan petro-state has developed environmental regulation processes and institutions that forward rapid, extensive oil development and do not meaningfully restrain the resulting environmental impacts. The shared interests by government and industry in tar sands development amounts to strong consent for tar sands developments and it translates into an environmental policy regime that is biased toward tar sands development. The regulatory system has been "molded," to use Karl's term, to support these developments and to restrain or impede effective environmental regulation.

## Analyzing the Tar Sands from Political Ecology[5]

Political ecology's[6] primary theoretical contribution is its understanding of capitalism as systematically, inherently creating environmental crisis due to its drive for continuous growth and extraction and its externalization of environmental costs. Importantly, environmental costs are unequally borne with, for example, environmental degradation tending to concentrate on marginalized groups (Peet and Watts 1996). These tendencies contribute to crises in capitalism itself (increasing costs or restrictions on environmental inputs as well as oppositional movements to the impacts of economic growth) to which capitalism readjusts. The state, for its part, already hollowed by neoliberalism and near-sighted by electoral cycles, is dependent on revenue generated by this system-in-crisis and pressured by its beneficiaries. Government policies and institutions reflect these constraints. Hence Brynt's analysis of policy as "the embodiment of societal divisions and struggle and the narrowed interests of the state itself" (1992, 18)—policy arises from political struggles and conflicts marked by power inequalities.[7]

The political ecology methodology, to match this ambitious theoretical terrain, involves a highly contextualized understanding of development processes in reference to the larger political-economic systems informing them. The analytical starting point is at the level of particular impacted landscape or ecological problem, then attention is

[5] For an elaboration of this discussion, see Carter and Zalik (forthcoming).

[6] I draw primarily on Adkin (2000, 2003), Alperovitz, Williamson, and Campbell (2000), Benton (2000), Brynt (1992), Blaikie and Brookfield (1987), Gale and M'Gonigle (2000), Keil et al. (1998), Neumann (2005), Panitch et al. (2006), Peet and Watts (1996), Peluso (1992), Peluso and Watts (2001), Robbins (2004), Walker (2003), and Watts (2000).

[7] More work is needed on policy analysis in political ecology, a point raised most directly by Walker (2006). Figuring out how to "get the camel's nose of radical critique under the tent of mainstream policy" (338) will remain a central challenge for political ecology.

turned to how the broader extraction patterns or economic systems pressure this environment. Central to this study is an analysis of regulation patterns that set the context for these human-environment relations, particularly the conditions of access to and use of resources. Guided by this political ecology theory and method, this paper attempts to make sense of environmental impacts outlined in the next section through an analysis of environmental regulation trends and the broader political economic system informing it.

**Tar Sands Production and Environmental Impacts**

Declines in conventional oil production in Alberta since the 1970s have been offset by tar sands production which has outpaced conventional oil production since 2002 (Mansell and Schlenker 2006, 14). Tar sands underlie 140,200 square kilometers of boreal forest concentrated predominantly in northern Alberta in three major deposits: the Athabasca (with the greatest concentration of extraction activity), Cold Lake, and Peace River.[8] Massive investments in the tar sands supported the production of 1.33 million barrels of per day in 2009 (up from 1.13 million in 2006) (Canadian Association of Petroleum Producers 2010, Table 3.2a). Alberta Energy predicts 2020 output will be at 3 million barrels per day and "possibly even 5 million barrels per day by 2030" (Alberta Energy 2008, Table 3.2a).

The tar sands have become the fulcrum of Alberta's energy economy and the scale of the expansion of the mined area has created serious environmental impacts.[9] From 1967 to 2006, tar sands developments had a "cumulative disturbance" of 650 square kilometers (Timoney and Lee 2009) with great expansions expected as 84,000 square kilometres have been leased for tar sands development and leasing continues every two weeks (Pembina Institute 2010). As for freshwater, tar sands operations had licences to divert 349 million cubic metres per year from the Athabasca River in 2008 (double Calgary's yearly volume) with new projects potentially raising this to 500 million cubic metres (Dyer et al. 2008, 3, 8). There are now serious concerns about maintaining basic in-stream flow (Griffiths and Woynillowicz 2009). Beyond water withdrawals, enormous tailings "ponds" containing toxic materials from tar sands operations—now

[8] To date, Syncrude Canada Ltd., Suncor Energy Inc., and Shell Albian Sands Energy are the three major bitumen producers using primarily surface mining methods with in situ methods on the rise. Syncrude is a joint venture among Canadian Oil Sands Limited (36.74%), Imperial Oil Resources (25%), Suncor Energy Oil and Gas Partnership (12%), Sinopec Oil Sands Partnership (9.03%), plus smaller shares to Nexen Oil Sands Partnership, Mocal Energy Limited and Murphy Oil Company Ltd.). Shell Albian Sands is operated by Shell Canada Energy, a wholly owned subsidiary of Royal Dutch Shell.

[9] The scientific literature on the environmental impacts of the tar sands, albeit limited, is summarized in Timoney and Lee (2009) with an important new addition provided by Kelly et al. (2009). The Pembina Institute has also provided some of the most thorough, independent publicly-oriented analysis of the environmental impacts of tar sands developments.

over one hundred and seventy square kilometres in total area (Energy Resources Conservation Board 2010a)—pose a risk to local ecosystems due to leeching at rates of millions of litres per day (Kelly et al. 2009; Price 2008; Timoney and Lee 2009). Alberta's tar sands operations also emit enormous volumes of air pollution (Timoney and Lee 2009, 73-74) including greenhouse gases (GHGs). In 2007 Holroyd et. al. estimated the operations would emit as much as 41.4 million tonnes of $CO_2$ equivalent (2007, 9) and the Pembina Institute estimated that over the 2003 to 2010 period, carbon emissions from the tar sands projects would contribute between 41% and 47% of Canada's anticipated "business-as-usual growth" total annual emissions (Bramley, Neabel, and Woynillowicz 2005, 5). The developments also entail staggering emissions of nitrogen oxides ($NO_x$), sulphur dioxide ($SO_2$), and volatile organic compounds (VOCs) (Dyer et al. 2008, 25-33; Timoney and Lee 2009, 73-74). The result of these combined impacts has been a decline of numerous species, many endangered or threatened, for example caribou, lynx, marten, fisher, wolverine and multiple bird species (Schneider and Dyer 2006; Timoney and Lee 2009).

The most obvious burden of these impacts are on local communities in the surrounding area and on the predominantly aboriginal communities downstream who are at risk of compromised water, air and subsistence food supplies. More recently, connections have been made between the environmental degradation associated with the tar sands and illness in communities downstream (Timoney and Lee 2009, 78). These local communities also see landscapes transformed and solely devoted to tar sands projections, limiting traditional uses. Broader still, tar sands developments stress a major river system in an increasingly drought-prone province and result in water pollutants being transported into the fragile inland Peace-Athabasca Delta and through the Mackenzie Basin to the Arctic ocean (Kelly et al. 2009, 22346-22351), with airborne pollutants increasing soil and lake acidification risk eastward in neighbouring Saskatchewan and Manitoba (Bytnerowicz et al. 2010; Jeffries, Semkin, and Gibson 2010). Further, the significant emissions of climate change causing GHGs will extend to Albertans, Canadians and the global community. Emissions from the tar sands are a significant barrier to Canada meeting its national greenhouse gas reduction commitments (Bramley, Neabel, and Woynillowicz 2005). Current and future generations of people living in the local area and far beyond, as the implications of climate change from these emissions are global, cope with the negative environmental impacts of tar sands developments. I argue below that these multiple, far-ranging and long-term environmental impacts have not been effectively prevented or managed by the provincial regulatory system in Alberta.

## Environmental Regulation Trends[10]

The Alberta Crown owns 97% of Alberta's tar sands mineral rights (Alberta Energy 2006, 1 -1) and according to multiple sections of the Canadian Constitution, Alberta has "exclusive" regulatory powers over the tar sands (Vlavianos 2007c, 4-5).[11] Three problems with the provincial regulatory system stand out: the timing and impact of environmental consideration, important regulatory gaps, and the management of cumulative impacts.

*i. Ineffective and Delayed Environmental Consideration*

During interviews with policy makers within the key departments of the Alberta Government as well as with representatives of research institutes and non-government organizations (NGOs) closely involved with tar sands development processes, it was frequently noted that Alberta Environment, the department responsible for regulating environmental impacts in the tar sands, is in a structurally weak position in the decision making and regulatory process, particularly in comparison to the departments that promote hydrocarbon extraction, Alberta Energy and the Energy and Utilities Board (EUB), now the Energy Resources Conservation Board (ERCB).[12] As discussed below, the regulatory scope of Alberta Environment is too narrow and its input occurs too late, after the leasing of land has occurred and property rights have been assumed.

At the leasing stage, environmental impacts are considered at the Crown Mineral Disposition Review Committee's (CMDRC) initial review of companies' requests for land auction but only in a cursory manner. As Holroyd et. al. note, this is "the one and only opportunity during the tenure process to consider the environmental and social impacts of granting oil sands rights," but this process is too narrowly focused (there is no room for a consideration of cumulative impacts), too rapid, poorly informed, and has no

[10] Beyond scholarly literature and more publicly-oriented research reports, the primary sources for this section include interviews conducted since the spring of 2007 with policy makers in key Albertan government departments and agencies (Alberta Environment, Alberta Energy and the Energy and Utilities Board), as well as elected officials and representatives of involved environmental non-governmental organizations, social justice non-governmental organizations, research and law institutes, and independent researchers. In accordance with an ethics clearance from the Interdisciplinary Committee on Ethics in Human Research at Memorial University of Newfoundland, these interviewees will remain anonymous. Where direct quoting is necessary, I refer to the interviewee's general position in his or her organization.

[11] Of course, the federal government also has jurisdiction in specific areas; however, the extent of these powers is unclear, contested and under-tested, and their application has been unpredictable (Vlavianos 2007c, 67-68, 72). Also, as described below, federal agencies and departments with authority to intervene in Alberta to protect the environment have been reluctant to do so.

[12] In 2008 the EUB was divided into the ERCB, mandated to regulate oil, natural gas, tar sands, coal, as well as pipeline developments, and the Alberta Utilities Commission (AUC), regulating the utilities sector (electricity and natural gas markets) (Low 2009).

"formalized" environmental assessment process (2007, 21-22). Even if the environmental analysis were to be improved here, the CMDRC's role is merely advisory. Alberta Energy ultimately decides if land requested for auction will be posted. Significantly, Alberta Energy—the primary department promoting tar sands development—is closely aligned with the oil industry which it considers its "principal stakeholder."[13] Indeed, corporate requests determine the pattern and pace of land leases, in the absence of any provincial land use plan.

More thorough consideration of environmental effects occurs through Alberta Environment's environmental impact assessments (EIA). But even these have limited impact on the decision-making process because the EIA results are transferred to the former EUB and new ERCB where environmental considerations are overridden by other interests, particularly economic benefit. In spring 2007, interviewees familiar with the workings of the former EUB noted that the board was under continual political pressure to approve the projects for which Energy had already sold access rights.[14] According to Vlavianos, "it is clear that the EIA process under EPEA [Alberta's Environmental Protection and Enhancement Act] is not a central feature of the oil and gas development process in the province." The EIA "simply provides the EUB with environmental information," then it is the EUB "who will make the final determination about whether a project is in the public interest or not, and environmental impacts are only one consideration in the EUB's decision" (2006, 46).

These EUB trends seem to plague the new ERCB. For example, in 2009, the ERCB refused the request of ENGOs and policy institutes to reconvene joint panel public hearings to review approvals granted to Shell for its Muskeg River Mine Expansion and Jackpine Mine projects after the company stated it would not honour emissions reductions commitments. During project consultations, the company agreed to lowering emissions but when Shell flatly reneged on this commitment less than two years after the consultations, the ERCB declined to intervene (Cooper 2009; Woynillowicz 2009). The new board has also been criticized with not rigorously applying standards to protect the environment. In April 2010, ERCB approved Syncrude's plans for two tailings pond that will not meet the province's new and long awaited Directive 074: Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes, a regulation developed to phase out discharges to tailings ponds, until 2014 (Energy Resources Conservation Board 2010b; see also Dyer 2010a; Obad 2010).

Overall, the ERCB's and Alberta Energy's interests have consistently overridden any concerns raised by Alberta Environment in decisions on the tar sands. Based on interviews with those involved with the tar sands regulatory process, this trend is common knowledge both inside and outside the public service. As Alberta Environment

[13] Interview with Alberta Energy policy maker, April 27, 2007.

[14] Interview with EUB policy maker (Business Operations and Development), April 24, 2007. Note that this political pressure can be easily applied given the EUB staff: at the time of research on this issue in 2007 and 2008, the board was a highly politicized entity with nine board members appointed by cabinet through non-debated orders-in-council.

policy makers note, even in interdepartmental initiatives that are supposed to offer a "level playing field" for all ministries, energy interests "typically carry the day."[15] For its part, Alberta Environment rarely refuses approvals required by tar sands operations, perhaps due to support for these projects within the department. When asked about Alberta Environment's apparent reluctance to slow or reject projects due to environmental impacts, policy makers noted that "When things are good, you want to reap all the benefits you can. You don't want to stand in the way of that."[16] Another policy maker argued that not permitting a tar sands development to occur is "stranding" resource potential from Albertans.[17]

At the same time, policymakers committed to environmental protection within Alberta Environment have inadequate resources and staff to monitor and enforce regulations (see Phillips (forthcoming)). Woynillowicz, using statistics from the Alberta Government's Fiscal Plans from 2001 to 2008, notes *decline*s in Alberta Environment's staff since 2000, just as tar sands production was significantly expanding. Early numbers suggest "the department's budget has not grown in parallel with its workload" (Energy Resources Conservation Board 2010b; see also Woynillowicz 2006). Similarly, Timoney and Lee note the "paucity of relevant data available in the public due in large part to a decline in government monitoring in recent decades that has coincided with rapid and major expansion of the tar sands industry" (2009, 65).

*ii. Key Regulatory Gaps*

In addition to the overall structural position of the environment ministry within the government, are the multiple regulatory gaps or inefficiencies in environmental regulation. The most obvious and pressing example relates to GHG emissions. Tar sands projects are a major—and the most rapidly growing—contributor to Canadian GHG emissions (Richardson 2007, 37-38). For example, in 2008, Syncrude's Mildred Lake and Aurora North Plant sites were, combined, the third largest GHG emitter in the country (12.2 million tonnes emitted) and Suncor was the fourth largest (8.8 million tonnes) (Environment Canada 2009). While per barrel emissions are declining, improvements are outpaced by the continuous expansion of tar sands operations.

The policy response to this situation is notoriously weak. Current provincial targets will see GHG emissions rising until 2020, at which point they will begin a gradual decrease, arriving back at 2008 emission levels by around 2035. The Albertan policy, therefore, will delay real reductions in emissions for three decades. And the promised reductions are to come from carbon capture and storage (CCS) projects (Alberta Government 2008, 24) which are currently still in development and questionable in

[15] Interview with Alberta Environment policy makers (Oil and Gas Policy Sector and Electricity / Minerals Sector), April 23, 2007. On this point, also see Vlavianos' analysis of the relationship between the EUB and Alberta Environment (2007c, 58-59).

[16] Interview with Alberta Environment policy maker (Oil and Gas Policy Sector and Electricity / Minerals Sector), April 23, 2007.

[17] Interview with Alberta Environment policy maker (Environmental Policy Branch), April 23, 2007.

terms of their efficacy to reduce emissions within the critical timeframe (on the critical political issues associated with CCS, see Le Billon and Carter forthcoming; see also Dyer 2010b).

Policies to protect fresh water are equally problematic, especially with regards to the in-stream flow needs of the Athabasca River, the primary source for the water intensive tar sands projects. Guided by its *Water Act*, Alberta Environment issues licences for water withdrawals from the Athabasca River to oil sands companies. To date, the tar sands industry withdraws 349 million cubic metres annually (double Calgary's domestic withdrawals from the Bow River) (Pembina Institute 2007) and approved projects not yet in operation would double this amount (Richardson 2007, 43). Despite the problem of drought in a region that has experienced significant decreases in river flow over the last century (Griffiths, Taylor, and Woynillowicz 2006, 13; Griffiths and Woynillowicz 2009), tar sands withdrawals from the Athabasca River have only recently become a concern for the government.

The Cumulative Environmental Management Association (CEMA), a multi-stakeholder committee created in 2000 to manage the cumulative impacts of tar sands developments, struggled for years to define in-stream flow needs to guide withdrawal policy, but it could not reach consensus by its deadline of December 2005. Therefore, the federal Department of Fisheries and Oceans and Alberta Environment developed the Water Management Framework (Alberta Environment and Fisheries and Oceans Canada 2007), which sets limits on withdrawals during winter low flow periods at 5.2% of weekly historical median flows with maximum withdrawal caps of 15 cubic metres per second. Yet this policy runs counter to the recommendation of environmental organizations and aboriginal communities to permit no withdrawal during these periods given the risk to habitat (Pembina Institute 2007). According to the Oil Sands Developers Group (OSDG), a regional oil industry association, by 2010 tar sands projects alone will have exceeded the 5.2% winter weekly withdrawal limit and continue to grow to 6%, at which level withdrawals will stabilize until 2035. In the "growth case" scenario, 15 cubic metre per second water withdrawals—the current maximum withdrawal cap in low flow periods—may be standard by 2015 to 2030 (Irving 2008). This problem was admitted by the Alberta Government's 2006 Oil Sands Ministerial Strategy Committee report which noted that "Alberta Environment has not had the opportunity or the resources to undertake a review to determine whether there is sufficient water available" in key rivers to permit new developments (113).

Land reclamation is a third salient regulatory gap. As Vlavianos explains, project permits are issued "without a clear sense that reclamation is currently feasible but in the hopes that new technology will be developed that will someday allow for proper reclamation." Reclamation of tailing ponds is a particularly pressing issue given the lack of proven technology and methods (Vlavianos 2007c, 52). Reclamation results to date are poor: after over four decades of tar sands developments, Alberta Environment issued its first reclamation certificate in March 2008 to Syncrude Canada for reclaiming

one square kilometre of land.[18] As one participant in the oil sands consultations noted, "Development is going along at hyperspeed but reclamation is going along at geological speed" (quoted in Alberta Energy 2007b, 18).[19]

Finally, criticism is now frequently directed toward ineffectual public consultation (or, where consultation is adequately conducted, unheeded public consultation) on tar sands-related projects. During the land rights issuance process there is no opportunity for public input and perhaps even little public notice.[20] In Wenig's (2004) appraisal, the CMDRC's work is a "black box": there is no public involvement at this stage and very little public information about what the committee does.[21] At the level of the ERCB, public involvement could occur, but only if the proposed project were brought to a hearing and a hearing would be triggered only if people protested that they may be "directly and adversely affected" by an ERCB decision. If there were no private landowners or occupants of the land in question, a hearing may not be triggered.

Public involvement through Alberta Environment is greater than through Alberta Energy and the ERCB, but it is still delayed in both the EIA and licensing processes. During the EIA process, public involvement is permitted in a limited way, but only in the later stages. There is some room during Alberta Environment's licence issuing processes for tar sands projects for input from directly affected individuals and these licenses can be appealed through the EAB. But EAB decisions, like EIA reports, are non-binding on the Minister of the Environment (Environmental Law Centre 2006a, 2006b, 2006c, 2006d). Recent consultations such as the 2006-07 Oil Sands Consultation led by the Multi-Stakeholder Committee, the 2007 Royalty Review Panel Consultation as well as new "communication" and consultation efforts planned for fall 2010 (Fekete 2010) appear to be improving on this closed system, but these consultations produce only

[18] For an analysis and criticism of reclamation efforts to date, see Grant et. al. (2008).

[19] Note that after months of negative press following the oiling of ducks in Syncrude's Aurora tailings pond in April 2008, the Alberta Government developed (but not yet effectively implemented, as noted above) Directive 074 in February 2009 and it continues to subsidize research in this area. Examples include the 2002 provincial and federal investments in the University of Alberta's Oil Sands Tailing Research Facility, in partnership with tar sands companies, a total of $2.3 million dollar capital investment (Oil Sands Tailing Research Facility n.d.), the 2007 formation of the Imperial Oil-Alberta Ingenuity Centre for Oil Sands Innovation (a partnership between the University of Alberta's Faculty of Engineering and Imperial Oil with funding from the Alberta Government's Alberta Ingenuity Fund), and the new Government of Alberta $3 million grant to the University of Alberta's School of Energy and the Environment through the Energy Innovation Fund.

[20] As Alberta's Environmental Law Centre Fact Sheet on Oil and Gas Developments and Surface Rights (2006d) explains, even for "potentially affected surface owners or occupiers," there is "no direct notice" when rights to the land are offered for auction and leased. See also (Vlavianos 2007b).

[21] See also Vlavianos' (2007a) comments on the "complete lack of public participation" at crucial stages of the tar sands decision making process. This issue is explored in detail in Vlavianos (2007b).

recommendations for government with no guarantee of implementation. If consultations have no legal standing, the government is not required to enact recommendations (Vlavianos 2007c, 64). Therefore, as Acuña notes, "although the actual consultation process is an improvement over the window-dressing consultations of the Klein years, it would appear that the outcome will be no different—a government with no interest at all in actually acting on what Albertans are recommending" (Acuña 2007). For this reason environmental non-government organizations (ENGOs) frequently worry that these consultations provide a mere illusion of participation, while diverting the energies of activists.[22] This longstanding problem of accountability and public information access from Alberta Energy has been repeatedly emphasized in both internal governmental and more independent panel reports in recent years (Valentine 2008; Dunn 2007; Hunter et al. 2007).

These concerns seem founded to date: of the tens of recommendations resulting from the multi-stakeholder process in the government's "Responsible Actions" twenty-year strategy for socially and environmentally sound oil sands development (Treasury Board 2009), only two have been implemented over the last year (Cryderman 2010).

*iii. Analytical Gap: Cumulative Impacts*

A final problematic regulatory trend of note is the limited scope of environmental analysis in Alberta's tar sands which focuses on the immediate impact of specific projects as opposed to long-term, long-range effects. As industrialization expands, a regulatory process examining *individual* permits or projects without an analysis of regional, cumulative impacts is ever more inadequate, hence Timoney and Lee's urgent call for "comprehensive, peer-reviewed assessments of the cumulative impacts of tar sands development" (2009, 65).

Since the late 1990s there have been multiple institutional integration attempts to overcome the fragmented nature of decision making on tar sands development. Key examples include the Regional Sustainable Development Strategy (RSDS) for Athabasca Oil Sands Area and the CEMA (Kennett 2007). These initiatives have been marked by continual delays, primarily due to difficulties (genuine or contrived) in reaching a consensus. So far, there have been no tangible recommendations on development trade-offs and no clear framework for departments to address cumulative effects.[23]

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[22] As an example of recent work on this question, Fluet and Krogman study one public consultation process, the Northern East Slopes Sustainable Resource and Environmental Management Strategy. They find it to be marked by industry-capture, ENGO exclusion, and overly narrow terms of debate (for example, one that excludes non-use or intrinsic values). They observe that these consultations "may be represented as democratic but simultaneously maintain the power relations that produce the current model of economic development" (2009, 138). McInnis and Urquhart make a similar point and describe this phenomenon as "Public Participation as Symbolic, Manipulative Politics" (McInnis and Urquhart 1995, 247).

[23] Cause for optimism in dealing with cumulative impacts might be found in the 2008 Land-use Framework, the newest synthesizing initiative of the provincial government via its Sustainable

Overall, therefore, these policy integration attempts seem to be "parking lots" for complex issues with no significant impact on the development process. Worse, Hoberg and Phillips (2010) argue multi-stakeholder consultations and bodies like CEMA are defensive strategies of government and industry to "bolster the legitimacy of the policy process while maintaining control over decision-making, rules and venues"; they are strategies of "cooptation through consensus."

As discussions on cumulative impacts slowly proceed and research accumulates, tar sands projects advance toward an anticipated five-fold expansion (Oil Sands Experts Group Workshop: Security and Properity Partnership of North America 2006; U.S. urges 'fivefold expansion' in Alberta oilsands production 2007). Hence Wenig et. al.'s (2006) criticism (relating to freshwater extraction) of "regulatory foot dragging" within the Alberta government. As they note, while "bemoaning" the lack of a cumulative effects plan, "the province's Energy and Utilities Board has continued approving, and Alberta Environment has continued issuing new water licences for, successive oil sands operations." This pattern continues via the ERCB, as noted in its weak implementation of tailings pond regulations above.

Taken together, these trends—consideration of environmental impacts that is poorly timed and weakly integrated into the decision-making process on tar sands projects, alongside important regulatory and analytical gaps—indicate a fragile system of environmental regulation. Given this, the environmental outcomes described in the previous section are unsurprising. But what accounts for these regulatory patterns?

## Explaining Policy Trends: The Petro-Politics Regime

The dominant petro-political regime in Alberta is marked by two characteristics. First, the Albertan (and Canadian) government is strongly dependent on revenue from fossil fuels, hence the widespread governmental consent for and support of these developments. Second, this support is furthered by oil industry lobbying aimed to protect companies' access to the resource.

### *i. Government Dependence and Support*

Alberta is strongly dependent on revenue from fossil fuels with revenues from fossil fuels over the last decade accounting for over half of total provincial revenue, as well as for a significant portion of total GDP and employment revenues (this point is elaborated in more detail in Carter and Zalik (forthcoming). Tar sands are specifically important within the range of these fuels because they are anticipated to fill the revenue gap left by conventional oil and gas production which has been declining since, respectively, the early 1970s and late 1990s. Tar sands production will undergird Alberta's energy future; indeed, it outpaced conventional oil production since 2002 (Mansell and Schlenker

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Resource Development Department. Yet no strategy exists to date to implement this framework.

2006, ii, 13-14, 34). In the meantime, this unconventional oil is contributing to provincial revenues in the billions of dollars: for example, a recent study indicates tar sands royalties amounted to $4.276 billion in the 2003-04 to 2006-07 period (*Oil Sands* 2009). Broader still, tar sands developments have attracted significant investment with spinoffs felt across the province and country. According to the Canadian Association of Petroleum Producers (CAPP), in 2007 there was $18.1 billion dollars in capital spending for mining, in-situ and upgrading activities in Alberta's tar sands, up from $14.3 billion in 2006. The industry has forecasted $100 billion in new projects and expansions (Alberta Energy 2007a).

Given the current and anticipated economic benefits of the tar sands, the Alberta and federal governments have been reluctant to impose environmental regulation restraining tar sands development. Instead, both have actively supported the industry through research and development funding or subsidies and permissive taxation and royalty regimes also discussed in detail in Carter and Zalik (forthcoming).

Beyond fiscal measures, both levels of government have actively promoted and defended tar sands developments on both sides of the border. At home, provincial leaders have been adamant that tar sands expansion will continue, a point encapsulated in Premier Stelmach's well-known statement that the province will not be "touching the brake" on tar sands development (see, for example, *Premier Ed Stelmach: Speeches: Canadian Association of Petroleum Producers Oil and Gas Investment Symposium* 2007; McLean 2006). Since May 2008, these intermittent statements have been captured in a public relations campaign to "rebrand" Alberta. The $25 million dollar fund is commonly understood to help counteract Alberta's "dirty oil" reputation. Similarly, at the federal level, in a pre-emptive defense of the industry against *National Geographic*'s March 2009 article comparing the tar sands developments to "dark satanic mills" (Kunzig 2009), Canadian Environment Minister Jim Prentice stated that the tar sands are, and will remain, a critical resource for North American energy and the Canadian government will continue supporting them (*Prentice defends oilsands following National Geographic article* February 25, 2009).

Abroad, Alberta has a permanent and "lavish" office in Washington to promote tar sands investment and imports (Henton 2007). From this vantage point, Alberta defends the tar sands from U.S. policies such as the California's Low Carbon Fuel Standard[24] and the American *Energy Independence and Security Act* (EISA).[25] Alberta's efforts were joined with interventions by Michael Wilson, Canadian ambassador to U.S. (2006-2009), who actively intervened in the debates surrounding the development of California's Low Carbon Fuel Standard in 2008 to 2009, reminding Americans that

[24] This standard requires that all fuel sold in California have lower and declining lifecycle greenhouse gas emissions than industry averages.

[25] The EISA's section 526 prohibits American federal agencies (such as the military, a major buyer of Albertan bitumen (see McCullum 2005)) from procuring non-conventional petroleum whose GHG emissions exceed emissions from conventional petroleum sources. This section was originally intended to curtail the development of fuel from liquefied coal, a very GHG intensive process, but it could also apply to the tar sands.

Canadian crude oil from the tar sands "offers the U.S. enhanced energy security" (*Letter from Ambassador Wilson to Chairman Mary D. Nichols* 2008). Wilson also wrote to the U.S. Secretary of Defense, the Secretary of State, and the Energy Secretary in February 2008 to advocate that the tar sands be exempted from the EISA.[26]

Canadian efforts to defend the tar sands intensified during Barack Obama's presidential campaign after an aide of the candidate expressed reluctance in late June 2008 to import tar sands bitumen given its "unacceptably high carbon emissions" (Alberts 2008). Soon thereafter, at the August 2008 Democratic Party National Convention, senior Canadian government officials, including Tony Clement, chair of the environment and energy security cabinet committee, as well as oil industry representatives, met with Obama's representatives. Clement was quoted as stating that the Canadian government was lobbying in the U.S. at all levels of government and with senior leaders of both the Republican and Democratic parties, Congressional members, state legislators and governors as well as the mayors of major cities, to build a "sophisticated full-court press on Canada's issues with the United States of America" (MacCharles 2008). Prime Minister Harper then moved quickly to promote the tar sands to Obama upon his election in November 4. During Obama's first visit to Canada in mid-February 2009, Harper specifically emphasized the importance of the tar sands to American energy security, arguing that Albertan tar sands are a stable replacement for Middle Eastern oil.

Beyond defending the industry, the Alberta office in Washington actively promotes the tar sands, for example in its June 2006 participation in the Smithsonian Folklife Festival where the province spent $3.8 million over the ten day event to host U.S. legislators and dignitaries to bolster trade and, specifically, to draw attention to the tar sands' value to the U.S. This was symbolized by parking of a 200-ton heavy hauler truck used in tar sands extraction on the Washington Mall—a bold statement to American legislators that Alberta has the reserves to meet American energy security needs.

Not surprisingly, as it promotes and protects the tar sands industry, the government of Alberta seems reluctant to unearth or release information critical of the projects, such as health impact studies in downstream communities. Ecologist and statistician Kevin Timoney suggests the government has attempted to cover up health and environmental impacts of the tar sands, calling information control in Alberta "world class" (CBC 2007). Another example is the Alberta government's reluctance to release new estimates of the number of migratory birds killed in April 2008 in Syncrude's tailings pond—1606 as opposed to the originally reported 500. Syncrude reported increased numbers in the summer of 2008, but the more alarming count was not released publicly until April 2009. Similarly, the government has been reluctant to admit the seriousness of toxic waste leakages from tailings ponds, even as evidence of this problem mounts (Kelly et al. 2009; Price 2008). Alberta Environment scientist,

[26] A coalition of American government agencies is simultaneously trying to have the tar sands considered conventional fuel (Agencies may clear oil sands under energy law, 2008).

Preston McEachern, minimizes such concerns by arguing that "You would not be able to distinguish this seepage from natural contamination" (Mittelstaedt 2008).[27] Similarly, Alberta Energy Minister Mel Knight has argued that "You can see bitumen running out of the banks of the Athabasca River on a hot summer's day […]. It's been going on for millennia and it's not as if we're dumping oil in the river and no one else is doing anything. Mother nature has done that for decades and eons" (Iwerks 2008).

For its part, the federal government has jurisdictional authority for inland fisheries, migratory birds, and environmental impacts crossing environmental boundaries (Vlavianos 2007c, 67-68), but it hesitates to intervene in the tar sands. This reluctance can be explained in part by the federal Liberals' past conflicts with Alberta over the National Energy Plan (proposed in the early 1980s by the Trudeau Government), and the provincial government's fierce defense of its sovereignty over natural resource revenue. However, the federal Liberal Governments of Jean Chretien and Paul Martin were also reluctant to regulate greenhouse gases under the *Canadian Environmental Protection Act* due to strong lobbying from business associations and the Alberta provincial government. More recently, the federal Conservative government refrains from intervening in the environmental sphere because it shares fully the neo-liberal orientation of its provincial counterpart. The federal government's unwillingness to intervene is documented in the Parliamentary Standing Committee on Natural Resources report on the tar sands (Richardson 2007, 35-37). Note, however, that the federal Department of the Environment recently prosecuted Syncrude for its failure to deter the ducks from landing on its tailings pond in April 2008, under the *Migratory Birds Act*. In June 2010, Syncrude was found guilty under both Alberta's *Environmental Protection and Enhancement Act* and the federal *Migratory Birds Convention Act* of not exercising due diligence to protect birds from its tailings pond. Convictions are pending further arguments to be heard in August 2010.

*ii. Industry Lobby*

Government support for the tar sands is reinforced by the oil and gas industry lobby, the second major actor in Alberta's petro-political regime that shapes the province's environmental regulation. [28] The tar sands industry attempts to influence the provincial government and public support for tar sands developments to protect its investments and profits. Recent data on corporate spending in the tar sands show that from 1997 to 2007, tar sands capital expenditures for in-situ production, mining and upgrading totalled $90.5 billion dollars, peaking in 2007 at $18.1 billion dollars. In addition, operating costs totalled nearly $68 billion, also sharply rising in the latter years of that

[27] Note that McEachern recently appeared in the media again, this time to apologize for describing Timoney and Lee's work, which summarizes the scientific and grey literature on the environmental impacts of the tar sands, as "a lie" (Scientist apologizes to oilsands researchers 2010).

[28] The focus of this section is on the major extractors, Suncor, Syncrude and Shell Albian Sands, along with the largest industry lobbying association, the CAPP.

period (Statistical Handbook for Canada's Upstream Petroleum Industry 2009, table 4.16b). Even in a recession, significant investments continue.

These investments generate impressive earnings and profits. Tar sands producers' annual sales have increased dramatically from $4.9 billion in 1999 to $37.8 billion in 2008 (Statistical Handbook for Canada's Upstream Petroleum Industry 2009, table 4.19b). Information on overall net profits is less available; however, data available on net income for individual companies provide a sense of the value of these operations. In a recent industry comparison of net income of publicly-traded oil and gas companies in Canada in 2009, the top five net earners, all active in tar sands developments (Encana Corp., Canadian Natural Resources Ltd., Imperial Oil Ltd., Husky Energy Ltd., and Suncor Energy Ltd.), had an average net income of $1.5 billion[29] (The Top 100 Canadian Publicly Traded Oil & Gas Companies 2010).

These are high stakes and industry players have extensive means to protect their access to lucrative resources. Consequently, coordinated and led by the CAPP, they have entered the environmental regulation debate, lobbying the provincial and federal legislatures. Available data demonstrates this well: for example, data from the Office of the Commissioner of Lobbying of Canada shows that in 2009, Environment Minister Jim Prentice had the highest number of contacts with lobbyists and the majority of these were with fossil fuel industry representatives including major players in the tar sands (McGregor 2010). In communicating with political leaders, the fossil fuel industry repeatedly raises concerns about costs and delays associated with environmental assessments and regulations. For example, in May 2009, CAPP along with the Canadian Association of Oilwell Drilling Contractors and the Small Explorers and Producers Association of Canada, presented arguments to the House of Commons Standing Committee on Industry, Science and Technology for loosening environmental regulations generally and clarifying uncertainty around GHG regulations. They argued these regulations have added to operating costs in Canada to the point that, according to the executive director of the Small Explorers and Producers Association of Canada, Gary Leach, "Canada provides among the lowest rates of return on investment in the world" (quoted in Akin 2009).

The fossil fuel industry in Alberta has specifically lobbied hard against action on emissions reduction. Since the mid-1990s, campaigns to avoid emissions reductions requirements have been led by the Canadian Council of Chief Executives, CAPP and specific companies working in the tar sands. Industry advocated for voluntary emissions reductions or intensity-based emissions targets (as opposed to targets that would ensure and absolute decline in emissions), a low per-tonne price of carbon emissions and tax breaks for spending on reducing emissions. Prior to Canada's ratification of the

[29] Yet even these incomes were considered "anemic" due to the impacts of the 2008 recession—the industry was described as "primed for renewal" after "weathering the worst." Note that tar sands companies profit from these projects even at lower oil prices: estimates of costs to produce a barrel of oil from tar sands average under $40, although the established producers have still lower break-even prices.

Kyoto Protocol in 2002, Macdonald describes the anti-Kyoto lobby led by the oil and gas industry and the province of Alberta as "the largest public campaign ever seen in Canadian environmental politics" (Macdonald 2010, 16; see also Macdonald 2007; Urquhart 2005).

While lobbying key government ministries, tar sands companies also fund political campaigns and parties to encourage policy development amenable to oil interests. This is an under-researched subject; however, early work by Trevor Harrison reports a close correlation between corporate donations by oil and gas companies (among the major funders of the Conservatives) to political parties and the fossil-friendly policies of those parties (Harrison 2005, 100-101). Conversely, oil companies have also withdrawn funding after indications from Stelmach's government that the royalty regime might be altered to capture more revenues: oil industry donations to the Progressive Conservatives declined by 41% from 2004 to 2008 (Romanowska 2009).

These political maneuvers are supplemented by media campaigns at key moments in the debate on the tar sands, for example, CAPP's fall 2006 media campaign to counter the charge that tar sands operations use a significant amount of water. In the winter of 2008-2009, CAPP members also funded an intensive advertising campaign on Alberta television and radio networks to argue against the recommendations of Royalty Review Panel for increases in royalty rates. This was followed by the launch of a website in winter 2009 ("Canada's Oil Sands: A Different Conversation") to refute high profile media criticisms of the environmental impacts of tar sands developments. Similarly, in June 2009, executives of the Canadian Heavy Oil Association stated their intention to work, in coordination with other associations, companies and government offices, to improve the "perception of the oil sands" until the message reaches a "critical mass" (Tracy Grills, CHOA vice-president, is quoted in Collison 2009). At the time of writing (June 2010), Enbridge is running ads on commercial radio stations throughout British Columbia and Alberta to sell its Northern Gateway pipeline project to northern communities.

"Grassroots" community "engagement" projects are also central in the lobbying effort, for example CAPP's Energy in Action program (*Energy in Action* 2009) and Synergy Alberta, a non-profit organization it co-founded to "foster and support mutually satisfactory resource development outcomes in communities" (Synergy Alberta Conference 2008, 2008). Understood more critically, the initiative is a "civil peacekeeping organization" that measures success by pipelines developed or wells dug and jobs and profits created (Jaremko 2006). Likewise, Enbridge has created the Northern Gateway Alliance (essentially a pro-development coalition of local councillors and business people) and a website to create support for the project in the North.

Major players also make targeted, high-profile donations to community infrastructure such as recreation, health care and the performing arts. For example, Suncor recently announced $2.5 million for a performing arts centre in Fort McMurray following its $2 million commitment in 2008 to help develop the Northern Lights Regional Health Foundation's programs and medical equipment. Even more significant is the corporate funding to educational institutions, both to the university and college system. Since the 1970s, approximately $3 billion has been invested by industry and

government to support research on augmenting fossil fuel development in the province (Polczer 2004). One key joint initiative is the University of Calgary's Institute for Sustainable Energy, Environment and Economy (ISEEE) founded in 2003 by fossil fuel industry leaders to increase conventional and unconventional oil recovery rates. The institute is aligned with the Alberta Government's Alberta Energy Research Institute (AERI), formerly the Alberta Oil Sands Technology and Research Authority (AOSTRA), and has close ties with Alberta's fossil fuel industry, which is notable in the board of director's industry members. Another obvious example of the oil industry's reach into the university system is Imperial Oil Limited's $10 million commitment to the University of Alberta in 2004 for its Imperial Oil Centre for Oil Sands Innovation. At the time, this was the "largest investment ever made by Imperial in a university, and the largest single corporate cash commitment ever received by the university's Faculty of Engineering" (*Imperial Oil Contributes $10 Million for Oil Sands Research at U of A* 2004). Colleges see similar investments by industry, such as Ledcor Group's (a tar sands construction company), $1.5 million investment in the Northern Alberta Institute of Technology for an applied research chair in oilsands environmental sustainability and $250,000 in scholarship funds (Healing 2010), as well as Syncrude's $5 million donation to Fort McMurray's Keyano College (*What We're Doing: Social impacts* 2008).

To ensure continued access to tar sands resources and continued legitimacy to extract within an undemanding environmental regulatory system, the tar sands industry combines government lobbying and political financing with strategic media and community relations. A key element of this strategy is the energy industry's funding of targeted research programs or facilities in colleges and universities which help to ensure that companies have the labour force and research they require, all heavily subsidized by general tax revenue.

## Conclusions & Policy Recommendations

This paper has argued that the political-economics of the petro-state, primarily marked by the close symmetry of government and industry interests in developing remaining oil reserves, results in the ineffectual environmental policy regime surrounding tar sands developments in Alberta. The broader "petro-politics" of the province has politicized policy. In Brynt's words, here we see public policy as "the embodiment" of the tensions and interests in the state (1992, 18).

Alberta is not alone in exhibiting this trend. Taking a continental view, drawing on my ongoing research on environmental policy in "frontier" oil-dependent cases in the U.S. and Canada, the province can easily be compared to other "first-world" petro-polities exhibiting parallel environmental policy trends such as Saskatchewan, Newfoundland and Labrador, Alaska and Wyoming. Crippled environmental policy in response to the political economy of oil dependence is clearly widespread in these petro-polities as well. But are these weakened environmental policy approaches in Alberta and other similar cases inevitable? Does high dependence on oil *determine* state politics and, therefore, environmental policy? Undoubtedly, as demonstrated by the

resource curse literature, dependence on natural resources poses particular political-economic challenges to states. But in some cases, like Botswana and Norway, which are held up as examples of successful management of resource dependence, governments do overcome the resource curse and reap long-term economic and political benefits from the resources. In Auty's words, the resource curse is "not an iron law, rather it is a strong recurrent tendency" (1994, 12).

The resource curse literature is now elaborating on how states can intervene to turn a potential oil curse into a blessing (Humphreys, Sachs, and Stiglitz 2007; Rosser 2006; Weinthal and Jones Luong 2006) and these are policy recommendations that would benefit Alberta. First, governments can overcome resource curse outcomes by maintaining public control over the oil industry and, where it is necessary to engage with the private sector to develop the resource, negotiate contracts that ensure the owners of the resource (those ultimately paying the long-term bill of environmental degradation from oil developments) garner the majority of the benefits. Second, governments should ensure transparency on oil developments and the impact they have on government revenue and corporate profits. Government and corporate accountability tools advocated by international NGOs such as "PWYP" (publish what you pay) provide citizens with information on profits from public resources and on how governments spend the resource funds. To this I would add the need for clear and publicly accessible information on the full range of environmental impacts of the tar sands. Third, governments are advised to manage oil wealth wisely: rather than allow royalties and other funds from oil to enter the government budget as revenue, governments must save or invest oil revenues as non-renewable assets. Alberta's woefully underutilized Heritage Fund needs to be rejuvenated and insulated from wasteful spending by the party in power. This fund and other investments should then be used to diversify the economy away from non-renewable energy industries to develop a renewable energy economy. Together, these changes would have the effect of protecting the Albertan economy from the vicissitudes of oil prices and rebuilding accountability between citizens and the province, hopefully with the result of re-enlivening public engagement with politics.

Alongside these general recommendations to stave off resource curse impacts, the environmental regulation regime in Alberta needs dramatic improvement. As suggested in this paper, Alberta needs an independent, strengthened Alberta Environment with enhanced authority and capacity to monitor and intervene, independent environmental impact assessments that pay close attention to cumulative impacts, the implementation of regional, long-term land use planning with extensive "no-go" areas that are delineated and respected, requirements for the use of best practices and best available technology to limit the footprint of projects, and a process for confidential reporting of environmental incidents in the tar sands. The province also needs regulations on carbon emissions that result in faster and more significant reductions, regulations on water withdrawals that respect ecosystem integrity, standards that ensure more disturbed land is reclaimed faster, and enhanced, authentic public consultation processes that are meaningfully incorporated into decision making process in the province.

If governments cannot implement these policy changes, if there is a risk that the resource will not be used for the "good of society"—and this is clearly the case in Alberta—then Humphreys et. al. argue that "the best solution may well be to leave the oil and gas in the ground" (2007, 15). Until the environmental regulatory system is improved, new leasing for tar sands developments is unwise. Yet given global dependence on oil alongside declining reserves and increasing demand, it will be difficult to argue against the tar sands and other examples of "frontier" oil developments without alternatives. The most promising hope for ending or slowing the tar sands developments, therefore, is the creation of viable oil replacements.

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