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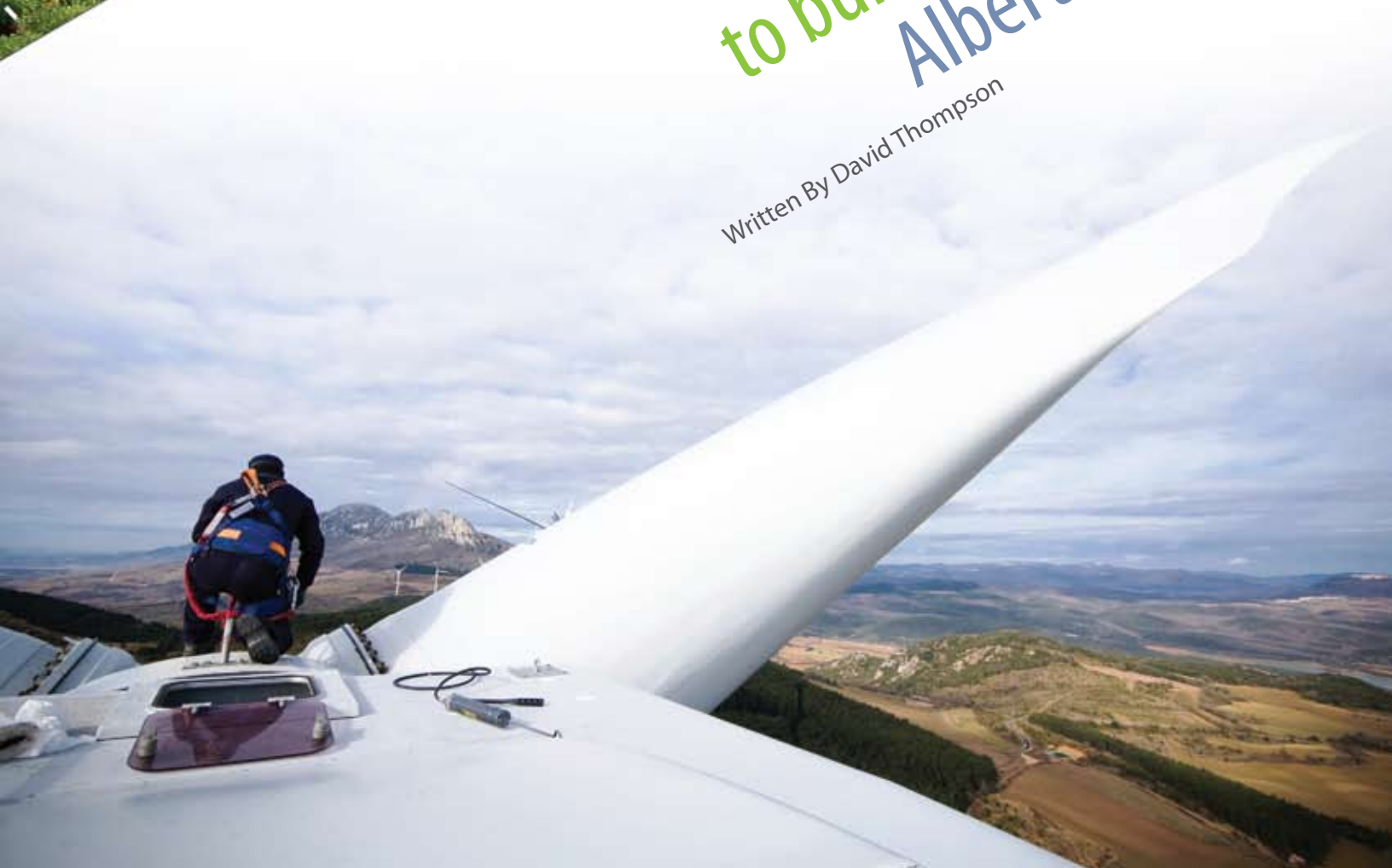
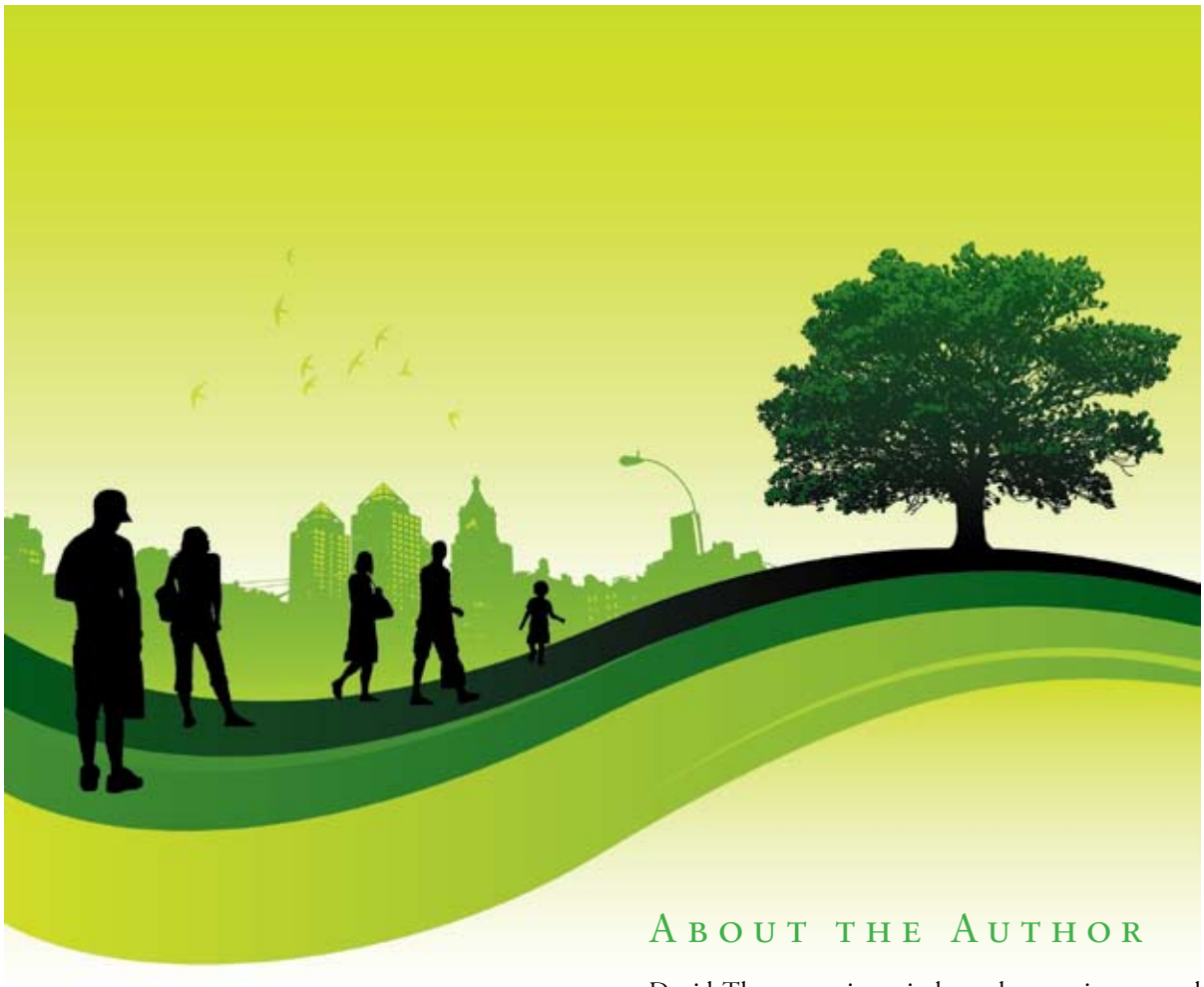
Alberta Federation of Labour

Green Jobs: It's time to build Alberta's future

Written By David Thompson





About the Author

David Thompson is an independent environmental policy consultant He has worked in government, the private sector and the not-for-profit sector, and holds postgraduate degrees in law and economics. His clients include First Nations, labour unions, non-profits, research institutes, governments, and universities.

Sierra Club Prairie is the Prairie regional chapter of the Sierra Club Canada. Sierra Club Canada is a member-based organization that empowers people to protect, restore and enjoy a healthy and safe planet.

Greenpeace exists because this fragile Earth deserves a voice. Greenpeace is an independently funded organization that works to challenge government and industry to halt harmful practices by carrying out peaceful acts of civil disobedience, negotiating solutions and educating the public.

The Alberta Federation of Labour is Alberta's largest trade union organization, representing more than 140,000 working Albertans from 30 unions in both the public and private sectors.

Acknowledgements

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Executive Summary

Labour and environmental groups are coming together – around the world and right here in Alberta – to call on governments to create green jobs.

For too long, the two groups have been pitted against one another. The story crafted by political and business elites is that you can either have jobs or you can have a clean environment, but you can't have both.

However, people don't buy that story anymore. The days of the jobs vs. environment myth are numbered. Environmental problems are increasingly seen as challenges to be overcome, and as opportunities to create good jobs cleaning up the environment.

The emerging cooperation between labour and environmental groups is flipping the traditional story, and creating a new way to see the environment and the economy. People get it. They understand that you can have a clean environment and a strong economy, and they like the idea of governments pursuing policies that will lead to the creation of green jobs.

This is why the Alberta Federation of Labour has joined with Greenpeace Canada and Sierra Club Prairie to explore and promote the idea of good, green job creation in Alberta.

What are green jobs?

In a nutshell, green jobs are a high-quality jobs that are saved or created by policies that will shift our economy toward greater sustainability. Green jobs are good jobs that let workers support their families and communities. Green jobs include familiar jobs with a new twist, like construction workers retrofitting homes to make them more energy efficient. And green jobs include new jobs creating and implementing technologies to preserve our environment. Green jobs give people the opportunity for learning – both on the job and through training programs.

The green jobs potential

There is good news, especially for the many Alberta workers who have recently been laid off: Alberta can create tens of thousands of green jobs right away.

Denmark's wind energy sector already employs 20,000 people, and California's plan to install a million solar panels will employ 15,000 people. Germany's renewable sector employs over 250,000 people. The U.S. is getting serious about energy efficiency, and aims to invest over $11 billion creating green jobs improving the environmental performance of homes. Spain, China, the U.S. and the UK are among many countries investing billions of dollars to updgrade their transit and high-speed rail, and creating hundreds of thousands of jobs worldwide in doing so.

Alberta can do this, too. With a far better fiscal position than most other jurisdictions in the world, Alberta has the capacity to make the needed investments. It can become a leader in Canada, and indeed a world leader, in clean energy and the development of a new green economy.

Alberta needs to get moving, and can get the job done

Alberta's economy is rapidly shedding jobs. With record job losses in the last few months, Alberta has slipped from having the lowest unemployment levels in Canada, to being second, and then third. According to the government, Alberta lost over 36,000 net jobs in the most recent three months. The net jobs figure conceals something far more troubling – since August 2008, over 135,000 full-time workers have lost their positions, with part-time employment making up the difference.

So far, the government's strategy has been to slosh several billion public dollars into the oil and gas extraction sector. This is unfortunate because of all 56 sectors in Alberta, oil and gas extraction creates the fewest jobs per dollar spent: only 3.5 jobs ("person-years" of employment) per million dollars spent. Investing in other industries, including green jobs industries, would create several times as many jobs. Transit, for instance, creates over 25 jobs per million dollars invested.

Another reason Alberta needs to create green jobs is because we need to dramatically reduce our environmental footprint. Among other problems, Alberta's greenhouse gas emissions are far higher than anywhere else in Canada, and are growing rapidly.

So far, the Alberta government's approach is a small carbon tax and spending $2 billion on developing carbon capture and storage (CCS) technologies. Unfortunately, the tax is too small to have much impact, and CCS is only suitable for capturing a small portion of CO2 from the tar sands. Tar sands operators have demonstrated their lack of confidence in CCS by declining to participate in the $2 billion government-sponsored research program.

We need to reorient the economy and get it on a more sustainable track. This is a task that government will need to undertake. The private sector on its own hasn't been able to do this. We need strong policies to encourage the development of green jobs sectors.

Fortunately, Alberta has the resources to do this. Alberta has tens of billions of dollars available for investing in green jobs and a cleaner economy. By adjusting Alberta's existing capital spending plans, along with other policies, we can create tens of thousands of green jobs.

What's more, when polled, the large majority of the public have stated that they want the government to invest in creating jobs in clean energy rather than in oil and gas.

Green jobs sectors Alberta should invest in

There are three main sectors where Alberta can create tens of thousands of green jobs:

Energy efficiency. Energy efficiency is one of the most attractive green jobs sectors because the money saved on reducing energy consumption often covers the full cost of the investments, and then some – it is a strategy that pays for itself. By retrofitting every home that needs it – insulating, weather-stripping, and installing high efficiency windows and furnaces – Alberta can put 6,500 to 14,000 Albertans to work over the next two years, while reducing energy consumption, emissions, and homeowner costs. This program would cost less than the $2 billion spent on the (now cancelled) natural gas rebate program in the last six years, and would provide higher payback to homeowners indefinitely.

Loan financing for commercial buildings and greener building code standards would extend the benefits of energy efficiency to other buildings across Alberta, and protect property buyers from high energy costs.

Representative jobs in this sector include electricians, heating/air conditioning installers, carpenters, construction equipment operators, roofers, insulation workers, carpenter helpers, industrial truck drivers, construction managers, building inspectors, and sheet metal workers.

Transit and high-speed rail. Establishing good transit systems can provide automobile drivers with an alternative, and in the long term can help rein in sprawl. And, of course, building good transit systems can put people to work.

Alberta can dramatically reduce our automobile dependency by rehabilitating buses and light rail transit (LRT) rolling stock, building rapid-bus systems, expanding LRT systems, and creating a new high-speed rail system on the Edmonton-Red Deer-Calgary corridor. Doing so would employ 19,000 to 28,000 Albertans over the next seven years. The investment – around $10 billion over seven years – is smaller than recent subsidies to the oil and gas sector, and would generate far more jobs.

Representative jobs in this area include: civil engineers, rail track layers, electricians, welders, metal fabricators, engine assemblers, bus drivers, dispatchers, locomotive engineers, railroad conductors, and front-line transportation supervisors.

Renewable energy. Fossil fuels are non-renewable, and thus are not going to last forever. They are a transition fuel, rather than the permanent fuel of our future. In other words, they will sustain our energy needs as we transition toward renewable energy, but we must make that transition.

Alberta can accelerate development of its renewable energy resources – wind, solar, and geothermal – by establishing renewable energy tariffs that encourage new renewable energy development. Mandatory renewable energy targets for utilities and bans on new carbon-emitting energy projects would also help to grow the proportion of renewable energy on the grid. A new provincial crown corporation – the Alberta Renewable Energy Corporation – could make early investments needed to rapidly build the sector, as took place with fossil fuel development decades ago.

A renewable energy sector created by these policies would employ thousands of Albertans over the long term, while reducing our emissions and our fossil fuel dependence.

Representative jobs in this area include electricians, computer software engineers, iron and steel workers, electrical engineers, electrical equipment assemblers, welders, metal fabricators, electrical equipment technicians, construction workers, machinists, construction labourers, operating engineers, and electrical power line installers and repairers, and sheet metal workers

Other green jobs policies

Other green jobs can and should be created in providing water treatment for First Nations communities, improving wastewater treatment systems, reforestation, and cleaning up contaminated sites. These opportunities can create many more good green jobs in rural and urban areas.

The government should also move quickly to eliminate subsidies that harm the environment, most notably subsidies to the fossil fuel sector and to motorized road use. It should also develop serious policies to reduce greenhouse gas emissions. These changes would help to diversify Alberta's economy by ensuring that industries can compete on a level playing field, and they would also develop a local and more sustainable economy.

Indeed, these changes would create a demand for workers and new skills, and Alberta would be wise to invest in education, job training and worker transition programs. Alberta should create an overall green jobs strategy, combining policy shifts to create green jobs, and green workforce development programs.

Conclusions

The Alberta government can start right now, putting tens of thousands of Albertans back to work, building a cleaner, greener economy.

The policy measures needed are straightforward, and the investments are very affordable. Certainly, they will create far more jobs than we are getting by throwing money at the oil and gas sector.

With the potential for tens of thousands of green jobs, and a cleaner and greener economy, the real question is: can Alberta afford to not make the investment?

Introduction

Myth: jobs vs. the environment

Reality: jobs and the environment

News from around the world is demonstrating that the old myth is losing traction. It isn't a world of jobs versus the environment. We can save and create jobs while improving the environment.

Moreover, we can save and create jobs by improving the environment.

Alberta needs to create jobs. It also needs to have a cleaner environment. It can do both. Other jurisdictions are doing so, and if Alberta doesn't jump out front and take a leadership role, it risks falling behind and losing a one-time opportunity

Green jobs strategies are rapidly being developed and deployed around the world. People and governments at all levels are working on home and commercial building retrofits to reduce energy consumption and owner costs. They are working on installing wind turbines and solar panels, reducing reliance on non-renewable fossil fuels and cutting greenhouse gas emissions. They are working on building out transit systems, thereby reducing automobile dependency and smog emissions.

The green jobs movement in the United States has been growing for almost a decade. Several years ago, the broad-based Apollo Alliance[1] began making the case for energy independence and green jobs through a shift to a clean energy economy. In 2006, labour unions and

environmental organizations founded the Blue-Green Alliance[2] to "expand the green economy and advance the rights of workers." Green for All was formed in 2008 to advocate for building a greener and more inclusive economy that can lift people out of poverty.[3] A number of other U.S. organizations have produced research and conducted advocacy to create green jobs policies at the local, state and federal level.

These years of work are paying off. Green jobs supporter Hilda Solis has been named Labour Secretary and Van Jones, the founder of Green for All, has been recruited to the White House Council on Environmental Quality. The administration's Middle Class Task Force has made investing in green jobs a central part of its program.[4] The U.S. government aims to invest $150 billion in clean energy and help create five million green jobs.[5]

The green jobs agenda is also gaining momentum at the state level. From Texas[6] to Minnesota,[7] from California[8] to Massachusetts,[9] green job summits are being held, task forces are forming, strategies are being developed, bills are being introduced and passed into law, and good green jobs are being created.[10]

Globally, the United Nations launched the Global Green New Deal and the Green Economy Initiative in the fall of 2008. This built on the Green Jobs Initiative of the United Nations Environment Programme (UNEP), the International Labour Organization, the International Trade Union Confederation, and the International Organization of Employers.[11]

Japan and Korea[12] are taking leadership positions, with each country proposing to create about a million green jobs. In the UK, Prime Minister Gordon Brown aims to create 400,000 green jobs by moving to a low carbon economy, noting that the UK economic recovery depends on green jobs.[13]

In Canada, the green jobs agenda is also beginning at the provincial level. For example, Ontario recently introduced legislation that aims to create 50,000 green jobs. While most provincial economies falter, Prince Edward Island's real GDP "is expected to grow by 0.6 per cent in 2009 – and stronger growth is forecast next year as the province gears up for the massive development of wind power energy on the island."[14]

The time has come for Alberta to take a leadership role in creating good green jobs.

The next section of this report examines what is meant by the term "green jobs." Certainly there is a growing interest in the phenomenon, but it begs the question of what is meant by the term; are they all jobs held by ecologists and hippies, or is a broader vision possible – one in which a wide variety of occupations are turned towards building a sustainable economy? There is room in the green jobs tent for a lot of high-quality jobs created by the move to a greener economy.

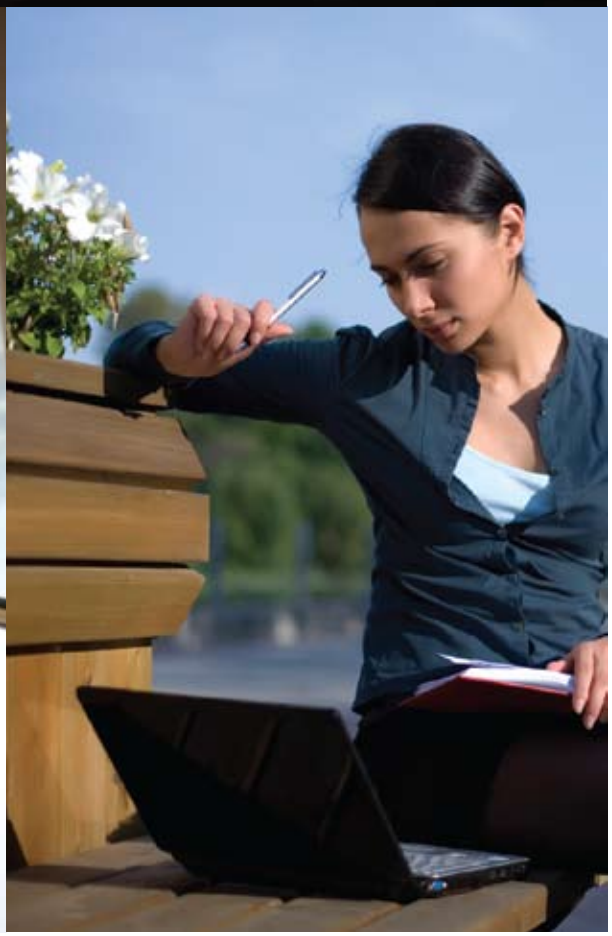
The report goes on to examine the reasons for the increasing global interest in green jobs, and why a green jobs strategy is needed in Alberta. It turns out the reasons are quite diverse – from the global economic meltdown to the need to tackle global warming and other environmental issues to Alberta's increasingly grim employment picture to the opportunity for Alberta to become a national and global leader in clean energy and the coming green economy. This section examines three main green sectors where Alberta can generate a number of good jobs while reducing our environmentalal footprint: increasing the energy efficiency of our buildings, expanding transit and rail transport, and developing our renewable energy resources.

The report then considers the question of how many green jobs Alberta should aim to create. Job losses in Alberta since summer of 2008 have been substantial, and it appears the good jobs are drying up. The good news is that Alberta's fiscal position allows it to invest in creating good green jobs that will put tens of thousands of Albertans back to work.

The next section of the report addresses the policies needed in order to create green jobs. In each of the three green job sectors, short-term and long-term policies are needed to jump-start the transition to a green economy and get people back to work immediately and for the long term. As has happened in other parts of the world, tens of thousands of green jobs can be created in these sectors, with thousands more in other areas. Of course, these new demands for workers will create a need for training, education and transition support, and a smart green jobs strategy will include these essential elements as a way of ensuring the strength of the sector in the future. These strategies should all be included in a provincial green jobs strategy.

The report next reviews the short-term, medium-term and long-term outlook of the transition to a green jobs economy. Each of these stages has a different emphasis in terms of where the jobs are created and what policies are being implemented.

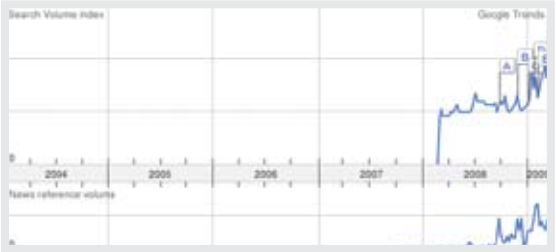
The report concludes with an overview of the number of good green jobs that can be created and the public investment and other policy instruments required to get there. It points out that the transition to a green jobs economy is within Alberta's grasp. The government of Alberta only need reach out and seize the opportunity.



What are green jobs?

The public curiosity about green jobs has increased enormously in Canada and around the world. The media is also taking an interest.

Growing interest in green jobs



- Google Trends search of "green jobs" [15]

What the figure above shows is that both Google internet searches (top graph) and news stories (bottom) have increased dramatically in recent months. It appears from the relative timing that the public's growing interest in the topic is driving media coverage, not the other way around In other words, it appears the public is curious about the green jobs phenomenon. Thus a good place to start is in defining what is meant by green jobs.

"The worst day of my life was when I got that pink slip. I expected to work in the steel mill until the day I retired, and then suddenly my job and my livelihood were gone. Then in 2006 a wind turbine company opened two plants near my home in Hollsopple, Pennsylvania. Today, I build the blades for wind turbines that are powering parts of America with clean electricity. A clean energy job saved my family and me, and many more in my community. But with the current economic mess, even some of my smartest and hardest-working friends here are still struggling ..."

- Troy Galloway, former Steelworker[16]

Many definitions of green jobs have been proposed,[17] and it has become clear that the green jobs agenda is broad, encompassing occupations from construction workers and electricians to engineers and planners to managers, financiers and other professionals. What they have in common is that green jobs employ their skills in creating a greener economy.

Clearly, green jobs are no longer the preserve of environmentalists.

In a nutshell, green jobs are a high-quality jobs that are saved or created by policies that will shift our economy toward greater sustainability. Some other characteristics of green jobs include:

- ***Good jobs***. Green jobs are good jobs. They are local jobs with a pension, and with fair wages that support families and communities. They can be entry-level jobs, if they are on a career ladder that a worker can climb up, or they can be mid-career or peak-career jobs. They are stable and less susceptible to volatile global commodity prices.
- ***Safe, healthy***, equitable workplaces. Green jobs comply with occupational health and safety standards, provide pay equity, and respect the right of workers to organize and create labour unions.
- ***Traditional occupations***. Many green jobs are in traditional occupations like construction, manufacturing, engineering, finance, or other fields. They are familiar occupations, but apply such skills to initiatives that improve the environment.
- ***New occupations***. Other green jobs are in new occupations – some that we haven't ever seen before and can't imagine yet. These are the kinds of jobs that will be held by young adults and youth currently in the education system – people who have new skill sets, new aspirations for their careers, and new expectations of their governments
- ***Community-based***. Green jobs are spread across the land. They are located in rural areas and urban areas. They are smaller and more evenly distributed than mega-projects, and they enable workers to stay with their families and live in their communities.
- ***Training programs***. Green jobs will be supported by training programs, where needed. The shift to a new, green economy will create demand for new skills and

new workers. In order to satisfy that demand, training programs will be needed to ensure an adequate supply of skills.

- ***Green the economy***. Green jobs will reduce pollution, improve the environment and help build the new, green economy. They will make our economy more stable and less vulnerable to oil markets, reduce our energy consumption and pollution, clean our air and rivers, and diversify our economy – all while building a sustainable, stable future for our children.

Green economy strategies will create many jobs that won't even be perceived as being green. Yet they will serve to improve the environment, whether directly or indirectly.

Types of jobs created by a shift to a greener economy.

"Some of these jobs will be in specialized areas, such as installing solar panels and researching new building material technologies. But the vast majority of jobs are in the same areas of employment that people already work in today ...

Constructing wind farms, for example, creates jobs for sheet metal workers, machinists, electricians, engineers, power linemen and truck drivers, among many others. Increasing the energy efficiency of buildings through retrofitting requires roofers, insulators, and building inspectors. Expanding mass transit systems employs civil engineers, electricians, and dispatchers. More generally, [a green jobs] program will provide a major boost to the construction and manufacturing sectors ... through much-needed spending on green infrastructure.

In addition, all of these ... strategies engage a normal range of service and support activities – including accountants, lawyers, office clerks, human resource managers, cashiers, and retail sales people."

- Pollin, Garrett-Peltier, Heintz and Scharber, "Green Recovery"[18]

Why green jobs?

Why is there an international movement toward green jobs, and why should Alberta join this movement? There are several reasons, ranging from the recession to global warming and other environmental problems to the nature of employment in Alberta and the coming shifts in energy, environmental and economic policy south of the border.

The economic downturn requires fiscal stimulus

"Ignoring environmental pressures during hard economic times will just put Canada further behind the curve."

- Avrim Lazar, president and CEO of the Forest Products Association of Canada[19]

The roots of the economic downturn go back several years, and the downturn began in earnest in 2008. Early on, the rest of the world hoped that their economies were "decoupling" from that of the United States, which would have allowed other countries to escape unscathed from the U.S. recession. As recently as spring 2008, even after record-breaking stock market declines globally,[20] The Economist was able to argue that "[w]ith luck, the world economy can rise above America's."[21]

By summer 2008, this wishful thinking had disappeared. The downturn had transformed into a full-blown crisis in the financial sector. It quickly became clear that there was no decoupling, as banks around the world slid and collapsed. "Wall Street's biggest crisis since the Great Depression"[22] led to an unprecedented U.S. government bailout, including hundreds of billions aimed at equity purchases. European governments soon found themselves nationalizing banks and insurance companies.

More recent estimates of the cost of U.S. bank bailouts are significantly higher, including up to $3.5 trillion (including loans and loan guarantees, $9 trillion could be on the hook), and this is just for the American banks.[23] This amount, of course, doesn't include the U.S. fiscal stimulus plan of over $800 billion.

Clean, green technologies can spur growth and create millions of jobs. Cloaked within the financial crisis is an opportunity to put our societies on a prosperous, more sustainable path."

- Ban Ki-moon, UN Secretary-General[24]

Alberta has not escaped the downturn. The private sector in Alberta is proving unable to sustain jobs, and Alberta has quickly slid from first to third place nationally in employment. By February 2009, Alberta had already exceeded the provincial government's job loss projections for the entire year.

The Canadian Energy Research Institute (CERI) has projected a loss of between $97 billion and $241 billion in overall tar sands investment,[25] and for the next few years predicts that "new capital investment will collapse to levels not seen since before the turn of the century."[26]

CERI points out that firms now have opportunities to source supplies more cheaply. This is an important observation, and one that applies to government as well, as noted by Premier Ed Stelmach, who noted, "We might as well upgrade [infrastructure] now while the costs are reasonable, rather than knowing you are going to be up against the wall a few years from now."[27]

It appears that the government is prepared to walk away from what had become its central fiscal policy. Alberta's Progressive Conservative Party has a long-standing, deeply rooted anti-deficit ideology, which has been a key driver of government fiscal policy for more than a decade. Indeed, during the last downturn the government steadfastly maintained a "balanced-budget law," slashing spending and thereby creating massive infrastructure deficits. The current downturn, however, is so steep and so sharp that the provincial government has said that it is willing to incur deficits, and amend the balanced-budget law to do so. The government has been signaling this shift since late in 2008.[28] This fundamental change in policy is coming at a high price in terms of the government's traditional allies, thereby illustrating the gravity of the situation.

The forecast for Alberta is an economic contraction.[29] Across the world, leading economists are recommending stimulus investments, as monetary policy has utterly failed to stop the decline.

Fiscal stimulus vs. monetary stimulus

Fiscal stimulus is the investment of money by governments – either through tax expenditures or regular expenditures – in order to stimulate the economy directly.

Monetary stimulus is the reducing of interest rates in order to make credit more available and thus stimulate private investment.

Economic orthodoxy since the 1980s insisted that monetary policy was the only way to influence the economy. It appears that orthodoxy has been abandoned by leading economic commentators across Canada and the world. These commentators are now in agreement that fiscal stimulus is needed, and needed now.

As noted by Glen Hodgson, senior vice-president and chief economist of the Conference Board of Canada, "Governments can't afford to wait 18 months for the full benefit of lower interest rates to kick in ... fiscal action must now ride to the rescue."[30]

Monetary policy can sometimes provide economic stimulus, but it now appears that reductions in central bank interest rates have been ineffective at expanding credit.[31] In the U.S., the central bank rate was pushed as low as it can go in fall 2008. In Canada, the central bank rate was dropped sharply a few times, and is now at a record low. Through these adjustments, the crisis has continued and worsened. Now that rates are essentially as low as they can go, further cuts are not possible, and thus the stimulus role for monetary policy has come to an end.[32]

Perhaps the most useful role for monetary policy at this point is to stay out of the way (i.e. to avoid interfering with fiscal policy). When fiscal policies kick in and provide stimulus, it will be important for monetary policy to avoid sending conflicting signals (i.e. with higher interest rates that inflate currency values, hurt exports, and reduce access to credit, such as it is).

Of course, monetary policy is the purview of the Bank of Canada, and thus not within Alberta's control in any case, so a made-in-Alberta stimulus is going to mean a fiscal stimulus.

We need to tackle global warming and other environmental issues

The other major crisis facing the world today is global warming, a crisis far more grave than the current economic meltdown. Commentators largely agree that the economic meltdown will be temporary. Global warming, without deep cuts in greenhouse gas emissions, will not be temporary. Prime Minister Stephen Harper said it is "perhaps the biggest threat to confront the future of humanity today."[33]

This report takes as a starting point that we need to address the global warming crisis. It will not rehash the consensus among credible scientists regarding human-induced global warming, nor the economic costs of failing to act (except to note that Nicholas Stern now says his high-profile report underestimated the threat when it put the costs of global warming at 20 per cent of global GDP[34]). Suffice it to note that global warming is a catastrophe in the making, projected to cost trillions of dollars in economic harm, and mass extinctions within a generation.

Alberta certainly contributes more than its share of greenhouse gas emission – more than any other province in Canada,[35] despite being fourth in population.[36] With a U.S. government that is reinvigorating international action on global warming and examining the carbon content of its imported oil, Alberta will soon need to start taking serious action to reduce greenhouse gas emissions.

"Alberta's electricity system, currently based on coal, emits greenhouse gases at a rate almost five times worse than the national average."[37] Other environmental impacts of coal-fired electricity include releases of pollutants that cause smog, acid rain, asthma, respiratory and cardiac problems, heart attacks and cancer.

Beyond global warming, there are other serious environmental problems in Alberta. The tar sands development has flattened forests and created enormous toxic waste lakes that are fatal to wildlife. An Alberta Cancer Board study concluded that Fort Chipewyan, downstream from the tar sands, had elevated rates of certain cancers,

pointing out errors in an earlier government report that had given the all-clear.[38]

Alberta's "industrial heartland" is also home to major downstream fossil fuel activity. Residents in the area have complained for years about bad air quality, and anyone who has spent time in the area can attest to the validity of their concerns.

Although Alberta currently has no nuclear industry, development of nuclear is being proposed in order to generate electricity to fuel additional tar sands expansion. Beyond the major cost overruns and financial liabilities associated with the nuclear industry (paid for by governments and thus citizens), there still is no known solution to the problem of disposal of radioactive waste, which can remain toxic for hundreds of thousands of years.

There are many more environmental problems in Alberta, ranging from water scarcity and quality issues to suburban sprawl and smog. The cumulative impact of these issues is mounting. This report is not the place to discuss these environmental problems in detail; that discussion is occurring elsewhere.[39] Rather, this report aims at discussing the solutions – solutions that can help to protect the environment, while creating good jobs.

> "A 'green' fiscal stimulus can provide an effective boost to the economy, increasing labour demand in a timely fashion, while at the same time building the foundations for sound, sustainable and strong growth in the future." [40]

Alberta's employment picture

Alberta's employment picture is not pretty. There is a longer-term story of declines in traditional occupations, and recent major job losses in key industries have compounded the problem.

For Alberta, one key industry to examine is the fossil fuel extraction industry. Alberta's dependency upon the fossil fuel industry is often touted by that industry and by the provincial government. However, dependency on volatile oil and gas prices is nothing to celebrate, especially when it comes to employment, as is shown in Alberta during every economic downturn. Late 2008 through early 2009 reminded us of this fact, with massive job losses in Alberta – among the highest and fastest in the country.

The fossil fuel industry is obviously enormous, in both economic power and political influence, but when it comes to providing employment it punches well below its weight. The Canadian energy sector, which is far broader than just oil and gas extraction and coal mining,[41] comprises 7.2 per cent of GDP but only 1.9 per cent of direct employment.[42] A similar ratio exists in Alberta, where oil and gas extraction and mining account for 24.5 per cent of real GDP,[43] but only 7.5 per cent of direct employment.[44]

Governments maintain economic models and multiplier tables to help predict the impact of various policies and investments on GDP and jobs. What these models and tables show is that there are significant differences in how many jobs per investment dollar are created by different industries. When it comes to creating jobs, some investments are simply better than others; some create more jobs, and some create fewer.

An important reason for the difference in the per-dollar job creation potential across industries is that some industries are relatively capital intensive, meaning that they employ more capital (e.g. machinery) in their production. Other industries are more labour intensive, meaning they employ more people.

It turns out that the oil and gas extraction industry is very capital intensive, and it is the least labour-intensive industry in Alberta.

Not only is the oil and gas extraction industry the least labour intensive; it has been getting less labour intensive over time. Despite increasing production levels in all energy forms in the 1990s, the Canadian energy sector shed over 25,000 jobs during that period.[45] This matches a global trend in employment in the fossil fuel sector.

Fossil fuel jobs declining worldwide

"While coal production in the U.S. increased 32 per cent between 1980 and 1999, coal-mining employment declined 66 per cent, from 242,000 to 83,000 workers. Further, jobs in the coal industry are expected to fall by 36,000 workers between 1995 and 2020, even without any greenhouse gas – reducing policies, such as carbon caps or taxes, in place. In the oil industry, over 40 per cent of U.S. oil-refining jobs were lost between 1980 and 1999."[46]

"The coal, oil, and natural gas industries require steadily fewer jobs as high-cost production equipment takes the place of human capital. Many hundreds of thousands of coal mining jobs have been shed in China, the United States, Germany, the United Kingdom, and South Africa during the last two decades, sometimes in the face of expanding production." [47]

In Alberta, until recently, the expansion of unconventional fossil fuels - coal-bed methane (CBM) and the tar sands - concealed a significant ongoing decline in the labour rate for fossil fuel extraction. However, many of the tar sands-related jobs temporarily fuelled by high oil prices now have been cut.

Unfortunately, the provincial government gives a lot of money to the fossil fuel industry (see the discussion below on environmentally harmful subsidies) in a stated attempt at job creation. In the year after announcing its royalty rate increase, which was aimed at raising an additional $1.4 billion annually, the Alberta government quietly began committing to subsidies to the oil and gas industry. The first $1.2 billion came in April 2008, a month after Stelmach's election victory. The next $1.8 billion came in November 2008. In March 2009, another $1.5 billion was provided, bringing the total to $4.5 billion.

Significant criticism was levelled at this latest handout. For example, Andre Plourde, chair of the department of economics at the University of Alberta, and one of the government's hand-picked Royalty Review Panel members, said the new subsidies are "a really bad thing ... The cost to Albertans as the owners of the resource is really high," adding, "You just kind of give this stuff [oil and gas resources] away in a sense."[48]

Alberta Energy Minister Mel Knight has steadfastly maintained that the handout was about "putting Albertans to work."[49]

If the goal of the Alberta government really was to put Albertans to work, it should have taken guidance from its own economic multipliers tables, which show how many jobs can be expected from a given investment in various industries. Of 56 industries in Alberta, oil and gas extraction ranks 56th.

Public investments and multipliers

Economic multiplier tables are based on more detailed economic models. These models are aimed at predicting what happens in an economy when certain factors change. When government injects stimulus into an industry, there are employment effects at three levels: direct, indirect, and induced.

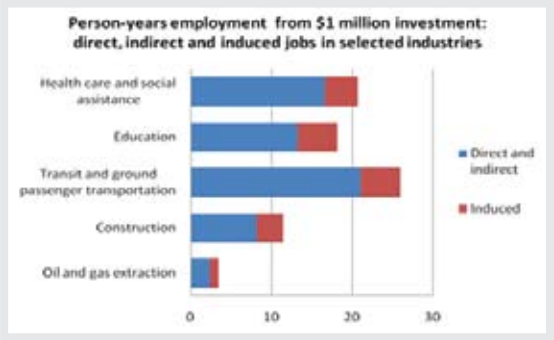
Direct effects. These are the jobs created in the industry where the investment is made. In the case of building retrofits for energy efficiency, this would be building, construction, and installation jobs putting in high performance windows or doors, insulation and weather-stripping, or high efficiency heating and cooling systems.

Indirect effects. These are the jobs created in the industries that supply the inputs to the industry where the investment is made. So, in the case of building retrofits, this would be jobs created in supplying windows and doors, insulation, weather-stripping or heating or cooling systems, including lumber, plastics, glass, steel, transportation of the products.

Induced effects. These are the jobs created by all of the workers noted above in the construction, manufacturing and service industries when they spend the money they earned on other products and services. Sometimes this is termed the "multiplier effect."

Multiplier tables provide employment numbers measured in "person-years." There is no standard for converting person-years of employment into jobs, as different employment positions last for different periods of time. Often, one person-year of employment is referred to as one job for greater readability, and this report follows that practice.

Indeed, for every million dollars invested in oil and gas extraction, only 2.4 jobs (i.e. person-years of employment[50]) are created directly in that sector and indirectly in all the sectors that supply it, combined.[51] If you take that figure and add all the jobs induced by the spending of those workers, you would get a grand total of 3.5 jobs for a million-dollar expenditure.[52]



- Source of data: Alberta Economic Multipliers[53]

Clearly, if the provincial government is going to invest the public's money in job creation, then it should be making better investments. It should be seeking a bigger bang for the buck, investing in sectors that maximize the development of jobs that support workers, families, and communities – and that reduce the province's environmental impact.

"The renewable energy sector generates more jobs per megawatt of power installed, per unit of energy produced, and per dollar of investment, than the fossil fuel-based energy sector."[54]

The future of fossil fuels and employment

While fossil fuel extraction creates few jobs per dollar invested, we can't overlook its significance to the Alberta economy. Currently, according to government figures, the industry directly employs 144,500 people, out of 1.98 million workers[55] – about 7 per cent of Alberta workers. And for each of those jobs, according to the industry and the provincial government, more than four indirect and induced jobs are created in the provincial economy.[56]

However, fossil fuels are non-renewable and extraction will, therefore, decline. Both conventional gas production and conventional oil production have already peaked in Alberta, and both are in decline. The only thing sustaining high fossil fuel production levels is unconventional extraction. Tar sands oil production and coal-bed methane (CBM) gas production have both increased in the last decade. However, as with conventional oil and gas, these sources will also become more difficult and expensive to access.

Simply put, the low-hanging fruit will become more scarce, and we will have to go and get the more difficult and expensive sources. For instance, the bitumen available in the tar sands to surface mine is quite limited, so we will soon be producing more from the deeper-buried bitumen, which comprises 82 per cent of the resource.[57] Ultimately, only 11 per cent of the bitumen is "generally accepted to be recoverable."[58] Likewise, with CBM extraction, larger wells will become scarcer, and we will need more and more small wells.

What does this mean for employment? The long-term growth in tar sands output will not be matched by a proportional growth in jobs. Currently, strip-mining in the tar sands predominates, but that will be declining, and is already being replaced by in-situ extraction of deeper deposits. The in-situ process is less labour intensive than strip mining. In 2005, CERI projected that by 2015 the tar sands will employ a little over 10 per cent of the Alberta workforce, and that proportion will decline slightly to just under 10 per cent by 2020.[59] Note that this estimate was based on a projection for future tar sands output,[60] which CERI has since revised downward.[61]

In the short term, greater numbers of CBM wells being drilled would mean more employment in that sector. However, at some point, the cost of CBM extraction could rise so high that it becomes cheaper to import liquefied natural gas (LNG). At that point, employment could drop sharply and permanently. There is also a good chance that with tar sands output being lower than projected, CBM gas drilling and employment will be reduced.

So the medium term is unclear, and in the long term fossil fuel extraction employment will decline. At that point, we will need a well-established green jobs economy. We will not want to be in the position of having failed to prepare for this change, which we know is coming.

In the meantime, we can expect some familiar patterns to dominate employment in the fossil fuel extraction sector. First, the industry will continue to reduce its labour intensity wherever possible, thus reducing the number of jobs per unit of output. Second, global fossil fuel prices will continue to fluctuate, creating uncertainty and instability in the jobs that do exist. Third, the low-hanging fruit will continue to disappear, and remaining fossil fuel resources will become more difficult to access, meaning jobs will continue to drift away from established communities, thus requiring longer commutes and more time that workers are absent from their families.

All of this suggests it would be unwise to maintain our over-reliance on the oil and gas sector as a generator of employment. The provincial government should be investing in a greener and more diverse future.

Other rural jobs in decline

Another area where jobs in Alberta have been declining is the agricultural sector. The family farm is gradually disappearing. There are fewer farms, and fewer farmers – a trend noted in every province – and farmers increasingly hold off-farm jobs to supplement their farm income.[62]

One significant cause of this decline has been the growing trend toward long-distance transportation of food. Of course, there was a time when most Alberta food was grown locally. The ingredients of the average meal now travel over a thousand kilometres before landing on the plates of Albertans. Apart from putting Alberta farmers out of work, this has resulted in high greenhouse gas (and other) emissions.

What allowed this increase in long-distance food transportation to occur are the heavy subsidies that air and road-based freight transportation receive (both direct cash subsidies, and the larger indirect environmental subsidies). The result is that local food production has become relatively more expensive, and thus buyers turn to imports while employment in Alberta's agricultural sector declines.

This is part of a global phenomenon, and the solutions are global. Serious international efforts to combat global warming will remove the subsidies built into transportation prices, and reveal their true costs (see later discussion on controlling greenhouse gas emissions).

Another cause of declining employment in agriculture is the shift toward reliance on chemical-intensive food production. Instead of encouraging farmers to employ workers to ensure the land is maintained and productive, agri-business and government have been encouraging reliance on chemicals – fertilizers and toxic pesticides and herbicides. In addition to introducing toxins to the environment, resulting in human exposure, and reducing the biodiversity and productivity of the soil, such changes reduce the labour intensiveness of agriculture

and replaces it with capital intensiveness. In other words agricultural chemicals displace agricultural jobs.

Policies to reduce chemical reliance would not only reduce the toxic load facing Albertans; it will also shift agriculture toward more labour-intensive agricultural production. The playing field between low-chemical food and high-chemical food will be leveled, and green jobs in agriculture will expand.

Farmers harvesting energy incomes

Farmers in Alberta are receiving $2,500 to $3,500 per windmill on their land, every year.[63] A 44-turbine wind farm was recently opened near Port Alma, Ontario. Local farmers will receive up to $300,000 a year for leasing their land.

The Port Alma project created 70 construction jobs, and additional maintenance jobs. It will generate enough clean electricity for 30,000 homes, thus reducing greenhouse gas emissions by 300,000 tonnes a year – the equivalent of taking 62,500 cars off the road.[64]

Another area of declining traditional employment is the forestry sector. The recent U.S. home building collapse and the mountain pine beetle epidemic have dominated news coverage, but they mask a longer-term decline in jobs caused by the structure of the industry. Forestry in Canada has shifted toward a model characterized by industrial logging – clearcutting that is dependent on expensive capital investment – and export of raw logs and raw lumber. The industry has, in this way, been shedding jobs for decades.

Other industry structures are possible. Small, sustainable woodlot production feeding into a value-adding domestic industry (building furniture and other products) would create stable, long-term jobs here in Alberta. Policies to encourage a sustainable forestry industry are needed, as well as international cooperation to combat global warming and incorporate the full costs of transportation into commodity shipping prices.

Being a leader in the green economy

Fortunately, the global green economy is coming. According to the UK's Business Secretary Peter Mandelson, it is already worth more than US$4 trillion and is growing fast. Countries around the globe have recently committed an estimated $200 billion to the green economy under economic stimulus plans, especially in the United States and Europe. UK Prime Minister Gordon Brown has stated that the recovery plan not only includes green jobs, but depends upon green jobs.[65]

"Jurisdictions that embrace the shift to a low-carbon, sustainable economy – aligning environmental goals with economic ones – will see more robust growth, more jobs and higher wages ... [T]he economic challenges facing Ontario families underline the need for the government to work even harder to ensure that Ontario is a leader in the transition towards a greener economy, attracting more green jobs sooner."[66]

Clearly, the green economy is going to proceed, no matter what the Alberta government does. So Alberta now has a choice; it can choose to lead in the green economy, or it can choose to follow. If it chooses to lead, it will make the investments and policy changes needed, and Alberta's green economy will get out in front. Albertans will reap economic, environmental and employment benefits. Albertans will get back to work, right now in good, green jobs. As explained below,[67] tens of thousands of green jobs can be created in energy efficiency, transit expansion, and the development of our renewable energy resources.

Alberta has the resources to become a leader in Canada, and indeed a world leader, in clean energy and the new green economy. As will be seen below, we can create tens of thousands of jobs this year in energy efficiency, building transit, and in the renewable energy sector. Doing so will mean that we develop domestic green industries and expertise more quickly than other jurisdictions, which will allow Alberta to turn around and sell our products and services to the rest of the world. One study found that a renewable energy industry that serves the export market can create up to 16 times the employment of an industry that only manufactures for the domestic market."[68]

Alberta can choose to become a leader in green exports, which will be increasingly in demand in the coming few years.

Alberta does have a choice, but it won't have this choice forever. Global industries are being built now. If Alberta waits, it won't have the ability to become a player; it will end up importing its clean energy infrastructure, instead of building it here, employing people here, and exporting it to the world.

Quebec has put in place policies that could make it "the manufacturing centre in Canada for wind energy."[69] Spain, wind turbine manufacturers are among the world's top ten, and are now locating production facilities in several other countries.[70]

The chance to become a green leader will not last long; Alberta needs to seize the opportunity quickly.

Green jobs sectors

The mix of green jobs in Alberta won't look the same as the mix of green jobs elsewhere. For instance, solar energy in southern latitudes will be stronger than here. In Ontario and Michigan, there could be a lot of jobs in greening the automotive sector by, for instance, producing electric vehicles. In Alberta, as in other places, we will need to focus on our strengths and on the local opportunities.

The primary green jobs sectors that Alberta needs to invest in are energy efficiency, transit, and renewable energy.

Energy efficiency

Energy efficiency is, in many ways, the best place to invest in green jobs in the short term. In terms of stimulus, energy efficiency is ideal, as it consists of numerous small projects that can be started right away. Insulating, applying weather stripping, installing high-performance windows and doors and installing efficient furnaces and air conditioning systems – these are the core of energy efficiency building upgrades. Many Albertans put out of work in recent months can be put back to work right away since not much training is required – the skills are mainly in place, as is the need, just awaiting the investment.

Energy efficiency numbers:

Approximately 15 per cent of an average household's expenditure is on energy used within the home,[71] and approximately 77 per cent of household energy use is in heating.[72]

Energy efficiency retrofits to commercial buildings can result in more than a 50 per cent reduction in energy consumption.[73]

For residents and workers, energy efficient buildings are more comfortable and pleasant to be in, avoiding drafts and cold spots in winter and hot spots in summer. For most building owners, energy efficiency can bring positive financial returns, with initial investments recovered within ten years or less. Finally, energy efficiency can lead to immediate, permanent and substantial cuts in greenhouse gas emissions.

Energy efficiency upgrade programs are being rolled out across the United States. Led by nearly $8 billion in federal funding,[74] states and municipalities are already receiving the funds and ramping up their programs. The federal government aims to weatherize a million homes per year.[75] An additional $3.2 billion was recently announced for local energy efficiency improvements to residential and commercial buildings.[76]

Transit

Transit and high-speed inter-city rail are necessary in order to reduce our automobile dependency. For many Albertans, transit is the principal (or only) practical

alternative to the automobile for the majority of their day-to-day trips. Moreover, good transit service can also help shape our communities, adding density and curtailing sprawl.

Expanding transit infrastructure and services means creating many jobs in the short term, as projects already on the books are accelerated. It also means a growing number of jobs in the medium term, as more projects get approval to proceed. Again, many of these jobs are quite familiar – e.g. repairs in rehabilitating and expanding the bus and rolling stock fleets, and excavations, grading, concrete pouring, electrical installations and the like in building LRT systems and high-speed rail.

Canada is far behind most major industrialized countries in providing transit and high-speed rail. Most large European cities, and many smaller ones, have mature subway and surface transit systems. Other jurisdictions are now accelerating spending on transit; for instance, the U.S. is planning to spend over $17 billion on transit, including high-speed inter-city rail, in addition to tax exemptions for employer-provided public transit benefits.[77] California is building out its high-speed rail, and in addition to the federal funds has committed state funds of $9.95 billion.[78] China aims to create the world's largest high-speed rail network, and is building 100 new high-speed trains – the longest high-speed trains in the world. Britain aims to build the fastest train service in the world within 12 years.[79] Spain's high-speed rail network is already significantly reducing car and air travel and thus carbon emissions; on a per-passenger basis, the rail trip from Madrid to Barcelona causes one-sixth the carbon emissions of a flight. Spain plans to invest CDN$180 billion building 10,000 km of track in the coming 12 years. Ridership is already up 28 per cent in one year.[80]

Renewable energy

Renewable energy holds a great deal of promise for Alberta in the medium and long term. Alberta has significant renewable energy resources yet to develop. Renewable energy is becoming cheaper every year, and every year the installed capacity increases significantly.

Many of the occupations in renewable energy are familiar ones – including construction, electrical work, and repair and maintenance, e.g. rooftop solar panel installations. However, some are relatively new, and will require significant training and skills upgrading, e.g. wind turbine assembly and installation.

The California Solar Initiative aims to put a million solar systems on roofs by 2017, creating an estimated 15,000 jobs.[81] In 2007 and 2008, employment in the U.S. solar industry grew by over 23 per cent to 80,000 people, one of the few bright spots in the struggling U.S. economy. Even this was dwarfed by the wind industry, which clocked employment growth of 70 per cent in 2008 alone, rising to 85,000 people.[82] Denmark supplies 20 per cent of its electricity consumption through wind power, and that industry employs 20,000 people.[83] Spain's renewable sector now employs 89,000 directly and 99,000 indirectly. In Germany, the sector had 259,000 direct and indirect jobs, and is expected to grow to 400,000-500,000 by 2020.[84] Globally, wind energy alone directly and indirectly employs 350,000, and assuming current targets are met it would employ over 1.4 million by 2030.[85]

> "2.3 million people have, in recent years, found new jobs in the renewable energy sector alone, and the potential for job growth in the sector is huge. Employment in renewable energies may rise to 2.1 million in wind and 6.3 million in solar power by 2030. Projected investments in renewable energy of U.S. $630 billion by 2030 would translate into at least 20 million additional jobs in the renewable energy sector."[86]

Closer to home, Ontario is proposing increases in wind power and solar PV for large, small and micro (rooftop) installations.[87] Ontario has about $4 billion in new renewable energy projects in place or under construction, and will have about 1,200 MW of wind capacity online by the end of 2009 – enough to power almost 325,000 homes.[88] And as noted earlier, PEI is expected to buck the trend of declining provincial economies and experience GDP growth, due to its wind power investments.[89]

Collectively, these three sectors – energy efficiency, transit and renewable energy – can provide tens of thousands of good, green jobs for Albertans. There are green jobs opportunities in many vocations.

As will be seen below, jobs can be created this year. Workers in Alberta who have lost their jobs in recent

months can be put to work right away, building a cleaner and healthier Alberta.

The benefits of a green jobs strategy will be felt in a lot of places, including households, businesses, and government. Below is a list of benefits from a green jobs strategy; it is indicative, and does not attempt to be complete.

Strategies for Green Economic Investment	Representative Jobs
Building Retrofitting	Electricians, Heating/Air Conditioning Installers, Carpenters, Construction Equipment Operators, Roofers, Insulation Workers, Carpenter Helpers, Industrial Truck Drivers, Construction Managers, Building Inspectors
Mass Transit/freight Rail	Civil Engineers, Rail Track Layers, Electricians, Welders, Metal Fabricators, Engine Assemblers, Bus Drivers, Dispatchers, Locomotive Engineers, Railroad Conductors
Smart Grid	Computer Software Engineers, Electrical Engineers, Electrical Equipment Assemblers, Electrical Equipment Technicians, Machinists, Team Assemblers, Construction Laborers, Operating Engineers, Electrical Power Line Installers and Repairers
Wind Power	Environmental Engineers, Iron and Steel Workers, Millwrights, Sheet Metal Workers, Machinists, Electrical Equipment Assemblers, Construction Equipment Operators, Industrial Truck Drivers, Industrial Production Managers, First-Line Production Supervisors
Solar Power	Electrical Engineers, Electricians, Industrial Machinery Mechanics, Welders, Metal Fabricators, Electrical Equipment Assemblers, Construction Equipment Operators, Installation Helpers, Laborers, Construction Managers

From Pollin, Garrett-Peltier, Heintz and Scharber, "Green Recovery"[90]

How many green jobs should Alberta aim to create?

Alberta has the resources to generate a lot of jobs from a shift to a greener economy. How many should it aim to create?

It is clear that in the very near term, a large stimulus spending package is required to revive the economy and save and create jobs. So the first and most important consideration is the number of jobs Alberta has lost recently, and how many will it be losing in the foreseeable future. The second consideration is how much of an investment Alberta can afford.

Replacing lost jobs

Employment is falling in Alberta, and job losses recently have been quicker than in any other province.

- In the most recent three months of statistics (December 2008 to February 2009),[91] unemployment in Alberta rose from 3.4 per cent to 5.4 per cent – "the highest in almost six years."[92]
- Tens of thousands of jobs lost in this period were in construction and manufacturing.
- In December 2008, Alberta had the lowest unemployment rate in Canada. In January, it slipped to second and in February it slipped to third.
- In those three months, net employment dropped by 36,200 people.

February 2009 alone brought a net loss of 23,700 jobs – "the largest drop in employment Alberta has ever seen," according to Todd Hirsch, senior economist for ATB Financial.[93]

Despite these numbers, the provincial government is sticking to its line that Alberta will only lose 15,000 jobs in 2009. Jack Mintz, Palmer chair of public policy at the University of Calgary said he doesn't know why the province is projecting that number, saying, "I think we have to be realistic that we're going to see a significant pickup in the unemployment rate in Canada."[94]

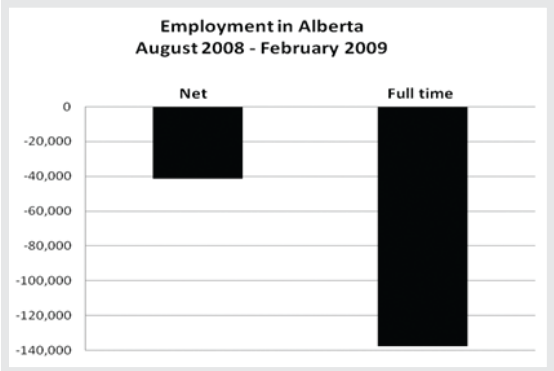
Whatever these numbers turn out to be in 2009, they are not insignificant, and they demand action.

However, the numbers above conceal even more troubling ones. The numbers above are net job losses. They are the jobs lost over that period of time minus new jobs added. The actual number of jobs lost is significantly higher.

If jobs are being added, does it matter that the number of jobs lost is higher than the net loss?

Unfortunately for Alberta families and communities, and for the provincial economy, it does matter. The jobs being lost are generally full-time, while the ones being added are part-time. For example in December 2008, while the net job loss was 15,800, the full-time job loss was actually 19,900, with part-time gains making up the difference.[95] So the net employment numbers mask larger declines in full-time employment – the good jobs that support families and communities, and the provincial economy.

What is the bigger picture for full-time and part-time jobs since the economic slowdown started to bite in Alberta? Between August 2008 and December 2008, net employment had dropped by 21,300 jobs, but full-time employment actually fell by more than five times as much: 109,500 jobs.[96] Part-time employment made up the difference. In January and February 2009, a further 28,200 full-time jobs were lost,[97] for a total of 137,700 since August 2008.



In key sectors of the economy – construction and manufacturing – the losses have been especially troubling. Between November 2008 and February 2009, manufacturing jobs were down 18,200 and construction jobs were down 29,200, for a total of 47,400.

What does the rest of 2009 hold for employment in Alberta? In all likelihood, the provincial government will soon revise its net job-loss projections upward from its current level of 15,000. However, even if we accepted the government's current prediction of 15,000 net job losses for 2009, and added the 21,300 from the fall of 2008, we would have net job losses of 36,300 people. This figure would conceal full-time job losses of about 130,000 to 140,000.

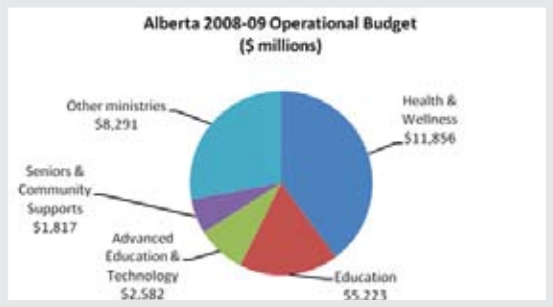
So how many jobs should the provincial government aim to create? It seems reasonable to conclude that, based on job losses, the government may want to create somewhere between 35,000 and 140,000 jobs. When it comes to the goal of greening the economy, it may want to develop more.

Funds available for a green jobs stimulus

In the short term, green jobs are going to be created by public spending. In the medium and longer term, they will be created by a mix of public spending and other policies that stimulate private spending.

Looking at the short term first, as could be expected, the numbers shows that Alberta has a very considerable capacity to invest in the creation of green jobs.

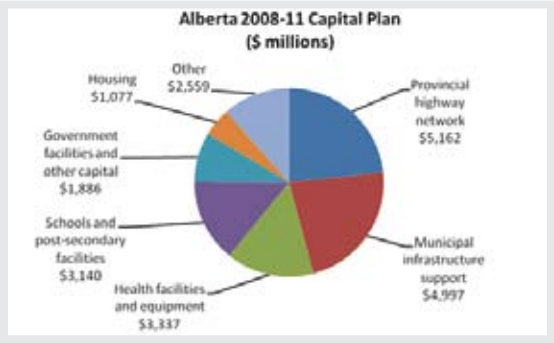
Every year the provincial government introduces its budget in the legislature. The budget has two aspects – operational spending and capital spending. Recent operating spending has been on the order of $25-$30 billion per year, and the capital spending has been on the order of $6-$8 billion per year.



Source: Government of Alberta[98]

Of course, a good deal of the operational budget is tied to existing long-term commitments, and so changes to operational budgets are best made slowly. However, new spending initiatives can be added.

In spring 2008, before the economic slowdown hit hard, the Alberta government announced a 20-year capital plan with spending of about $6 billion per year for the medium term.[99] The 20-year capital plan gives guidance to a 3-year capital plan, which sets out short-term capital spending. Within the short term, the government was planning to spend even more per year – over $22 billion over three years.[100]



Source: Government of Alberta[101]

This spending represents a tremendous opportunity to help steer Alberta's economy onto a more sustainable track – one that protects the environment while securing and creating new, high-quality jobs.

The short-term and long-term capital plans are not written in stone. And it is clear that their fundamental assumptions (e.g. over 3 per cent growth in 2009)[102] no longer hold true, at least for the immediate future. The plans anticipate their own regular updating, and this is the time to update them to address the reality that Alberta finds itself in.

It seems reasonable, in light of the need for stimulus, to advance some of the planned spending from later years into the immediate future, i.e. increase short-term capital spending.

Some could argue that we may be in a recession again in later years, and may need that money then. However, that would be speculation, while it's a certainty that we are in a recession now – a serious one.

If we don't get people back to work, we may be in this recession for longer than we otherwise would have been. Indeed, stimulating the switch to a green economy and creating green jobs could be a lot cheaper in the long run than standing on the sidelines.

Is the federal stimulus all that Alberta needs?

The federal government's budget calls for $22.7 billion in federal stimulus spending in 2009, and $17.2 billion in 2010.[103] Will this be adequate to shore up Alberta's job losses?

The non-partisan Parliamentary Budget Officer says the federal government's spending stimulus is effectively about 20 per cent lower than claimed. In addition, about $10 billion of the federal spending is contingent upon other levels of government contributing further funds.[104]

More to the point, the job stimulus impact of the federal budget has been called into question. For one thing, it is partly comprised of tax reductions, which are not an effective way of generating jobs. Furthermore, if Alberta's contributions, which are required to match the federal contributions, are required to be in areas with low job-creation potential, then the jobs impact of Alberta's stimulus spending in those areas will be low. The budget officer states that the federal job stimulus effect would be about 120,000 jobs, rather than the 190,000 claimed by the government.[105]

So assuming that the federal stimulus money would be allocated on a per-capita basis, Alberta's share would create about 12,000 jobs. This is less than a third of the number of net jobs that will be lost by the end of 2009, and about a tenth the number of full time jobs lost.

The federal government has said that it expects provinces to pick up the slack and provide their own stimulus. It seems clear that Alberta is going to have to develop its own job-creation strategy.

Funding sources

Where would Alberta find the dollars to advance its planned capital spending?

Alberta is sitting on significant net assets – over $47 billion.[106] This figure, being a net figure, takes into account both Alberta's assets and its liabilities. Of this, it has over

$25 billion in net financial assets alone (i.e. excluding the capital assets). In other words, Alberta is solidly in the black, and can easily afford to accelerate its capital spending to create green jobs.

The $25 billion in net financial assets is allocated among various accounts and funds. The two most relevant to short-term government spending are the Capital Account and the Sustainability Fund:

- The purpose of the Capital Account is to fund "infrastructure and other capital projects for the provincial government and local authorities."[107]
- The purpose of the Sustainability Fund is to help "protect the government's program and infrastructure spending plans from unexpected drops in revenue and the costs of emergencies, disasters [sic]. It can also be used for natural gas rebates and First Nations settlements."[108]

The provincial government's most recent projections for the fiscal year end peg the value of the Sustainability Fund at $7.65 billion and the Capital Account at $6.97 billion,[109] for a total of more than $14.6 billion.

> The Heritage Fund should not be used for stimulus. There is value in maintaining separate funds and accounts to achieve separate purposes. Having a Capital Account for capital spending makes sense. Having an account for countercyclical spending also makes sense (though the name Sustainability Account is perhaps not precise enough). The Heritage Fund should be a long-term savings account where money is saved until a time when Alberta's resources are dwindling permanently, rather than to combat a recession caused by other factors.

Another source of financing for short-term spending is borrowing. According to the premier, the interest rate on the Capital Account's earnings is higher than Alberta's borrowing costs, so Alberta can actually make money by borrowing instead of using its savings.[110]

If borrowing is pursued, payments on the debt can be covered by drawing down the assets (Sustainability Fund and Capital Account) or by net revenue increases brought about by the investments, or both.

Whatever methods are used to advance capital spending – investing some of the net financial resources directly or borrowing to invest – it is clear that Alberta can afford to advance that spending.

However, it would be wise to hedge somewhat against either future recessions or a longer recession than is currently anticipated. Instead of paying for short-term green jobs stimulus entirely by advancing money from future years' spending, we could look to another source: revising the existing capital spending plan. Consistent with the goal of shifting Alberta to a cleaner economy, we should look at revisions in two main areas:

Road Spending. Of about $22 billion in capital spending allocated in 2008-2011, the largest single allocation (over $5 billion) is to highways. An additional major chunk of road spending will come from the municipal allocation of nearly $5 billion. Subsidies to road use end up generating more road use, and the GHG and smog emissions that come with it ("build it, and they will come").

In order to reduce these and other negative impacts of excessive automobile use, we could defer or eliminate some of the funding of new highway construction. Over $3 billion could be freed up from the short-term new highway construction, while still maintaining all of the $800 million allocated to rehabilitation.[111] This would still leave over $1 billion in new highway construction spending, which could be used to complete the highest priority projects.

Carbon capture and storage. As recently noted in The Economist, carbon capture and storage (CCS) is an expensive and unproven technology.[112] Despite the Alberta government committing $2 billion to CCS pilot projects, we simply don't know if it will work in the long term to keep the carbon from entering the atmosphere. Whether it is successful in long-term storage or not, we do know that it would be a very expensive way to reduce carbon emissions. CCS costs several times as much as other mechanisms per tonne of CO2 removed. The fact that nobody has built a large scale commercial facility anywhere in the world that integrates capture, transport, and storage[113] suggests that its potential has been overstated by industry and governments keen to protect business-as-usual.

Re-directing some capital spending can make $5 billion available for building good, green jobs economy.

However, there doesn't seem to be much immediate prospect of using CCS in Alberta's rapidly growing tar sands.[114] The government had held up CCS as its centre-piece solution to GHG emissions from the tar sands. It even had claimed that CCS "will be responsible for 70 per cent" of its GHG emissions by 2050, and that "the bulk of these reductions will occur in production and upgrading" of tar sands.[115] However, a joint Alberta-Canada government report noted that CCS can only capture "a small portion of the CO2 streams" from the tar sands.[116] This is especially troubling given that the GHG emissions from the tar sands are set to eclipse even Alberta's predominantly coal-fired electricity generation system. Perhaps not surprisingly, the tar sands operators have declined to participate in the government's $2 billion subsidy scheme for CCS pilot projects.[117]

Furthermore, 91 per cent of Albertans think it is more fair for companies to pay the costs of cleaning up their pollution rather than having governments (and thus citizens) pay.[118] Because of this, because CCS is not cost-effective, because the long-term storage is unproven, and because industry now seems to have little confidence, it appears that spending $2 billion for CCS will be widely regarded as a boondoggle. A more responsible investment for public dollars would be to take those $2 billion and make them available to creating more certain and cost-effective green jobs, for instance, by boosting energy efficiency through retrofits to residential and commercial buildings. If CCS were truly a promising (as opposed to speculative) way to reduce CO2 emissions, then the private sector will invest in it in order to comply with existing and forthcoming carbon reduction requirements. If it is not promising, the private sector will invest in more effective and efficient mechanisms.

Thus, a total of $5 billion could be shifted from other areas of the capital budget to provide green jobs stimulus, and we can reduce our reliance on shifting forward capital spending from subsequent years. This can be done without touching planned amounts for highway rehabilitation, a billion dollars worth of new highways, full municipal support, health, education, and all other investments currently in the three-year capital plan.

The combination of advancing spending/borrowing and revising the existing capital spending plans gives Alberta the capacity to invest substantial funds in the short term to build the green economy and create green jobs.

Sources of loan capital

In addition to capital spending, Alberta can also provide loans to help the private sector fund its own investments in the new green economy. Making loan financing available would be very valuable in a time of limited credit.

Loans could be made from the Heritage Fund, provided they are adequately secured. The Heritage Fund could act as a form of "patient capital," eschewing large, immediate and speculative financial returns in favour of steady, reliable investments. It is noteworthy in this regard that the Heritage Fund's investment income in 2008-2009 was projected to be negative $2.4 billion, largely because of "weak equity markets."[119] It seems appropriate to steer some of the Heritage Fund's holdings away from playing the equity markets and put it into supporting green Alberta businesses and creating green jobs for Albertans.

Another source of loan capital would be the province's own capacity to borrow. With its AAA credit rating, it can borrow at low rates in order to obtain funds. Those funds can then be loaned out to finance projects aimed at building the green economy and creating green jobs.

Conclusion: financing green jobs won't be a problem

The above discussion shows that finding the money to create green jobs in the short term will not be a problem for Alberta. First off, it can redirect $3 billion in new highway construction, while fully funding highway rehabilitation, municipal road building and everything else in the capital plan. Second, it can re-direct $2 billion away from unproven and costly CCS. Redirecting capital spending can make $5 billion available for building the green jobs economy.

In addition, the over $14 billion in the Capital Account and Sustainability Fund are available for direct cash outlays. Some of that money should be saved, just in case this recession takes longer than planned, but some can be contributed to creating green jobs.

Finally, loans of several billion dollars can be financed by provincial borrowing, or out of the Heritage Fund; recent experience shows that such loans could be a more prudent investment than playing the stock markets.

Policies for creating green jobs

"Retrofitting Canada's buildings will provide immediate employment. Incentivizing clean energy and building green infrastructure will stimulate the economy of the future. Canadians need good jobs, immediate economic stimulus and rapid growth in the clean energy economy. In one stroke, green stimulus provides solutions to our biggest problems."

- Former Prime Ministers Kim Campbell, Joe Clark, John Turner and Paul Martin[120]

It is not enough to discuss general ideas or set goals and targets, however ambitious they may be. Nor can we create green jobs by simply providing education and job training programs. Providing such programs alone, without instituting the policies needed to build the green economy, would only serve to train workers for future unemployment.

In order to actually create green jobs, we have to create a green economy that has a demand for green jobs. And in order to create a green economy, we need new government policies. Carrying on with the status quo policies will result in no green economy, less employment, and a lost opportunity.

A favourable policy climate for a green economy and green jobs requires both short-term and long-term strategies at all levels of government. This section focuses mainly on the provincial level, and refers to municipal and federal policies as they relate to provincial policies.

Essentially, there are two ways to create investment in green jobs: engage in public spending and incentivize private spending. Public spending is fairly straightforward, and quick. Essentially the government makes a decision and cuts the cheque. In the area of green jobs, public spending is not only fast, it also can create a lot of jobs. One study found that a green infrastructure investment program would create "nearly four times more jobs than spending the same amount of money on oil energy resources."[121]

However, public investment by itself is not sufficient to ensure the transition to a green economy and the development of long-term, sustainable green jobs. If private sector activity was always pulling in the opposite direction of public investment the impact of the public investment would be severely limited. Furthermore, long-term, large-scale increases in public investment are inadvisable, as they would create structural deficits (not that all deficits are bad).[122] Thus, large-scale public investment should be seen as "priming the pump" in the short term. Policies are needed to steer private investment in the longer term.

Private investment is not so straightforward, and not so quick. It is prompted by governments implementing policy tools ranging from monetary policy to instruments that shift market prices (e.g. tax adjustments) to regulation that requires or prohibits specific actions. Private investment is usually slower to come into play because it requires first a government process to put in place the right policy instruments, and then a private sector response to those instruments. These built-in delays suggest that the policy tools to prompt private investment should be implemented as soon as possible. Adding delay to the beginning of the policy process could create a gap between the short-term, large-scale public investments and the longer term private investments. Even the potential for such a policy gap could result in delays to private sector investment, or even to outright failure to invest. The private sector needs certainty in the policy climate in order to plan its own actions.

Thus both the short-term public spending and the longer-term policies that will steer private spending should be implemented as soon as possible. This section discusses both categories for each of the three key green job policy areas: energy efficiency upgrades, transit, and renewable energy.

Stimulus: public spending is more effective than tax reductions

Both spending and tax reductions can put money into the economy. However, their job-creation potentials differ significantly.

Overall, government investments should be made in a way that maximizes their impact. When it comes to getting the most stimulus bang for the buck, tax reductions are an inferior instrument. First, a significant portion of money received by households and businesses in the form of a tax reduction tends to be saved, especially when economic uncertainty discourages spending and investment. Second, what does get spent is split between locally produced goods and imports. In the case of Alberta, with its narrowly based economy, many goods are imported, thus reducing the local economic impact of the tax reduction. Finally, tax reductions for businesses can be banked and claimed in future years, thus reducing their usefulness as short-term stimulus.

In contrast, government spending employs people directly, rather than splashing money around and later finding out that it was saved, spent on imports, or deferred into future years. Spending can be tailored to maximize local economic impact; activities like public works and construction are labour intensive and employ people locally.

Indeed an IMF study of OECD countries found that employment multipliers for spending were approximately double those for tax reductions.[123]

As Benjamin Tal, senior economist at CIBC World Markets put it, "When it comes to creating jobs and stimulating activity, infrastructure spending is a much more effective tool than tax cuts."[124]

Build Alberta's energy efficiency

Building Alberta's energy efficiency is the fastest and most cost-effective way to reduce energy consumption and emissions. It is also the fastest and most cost-effective way to generate jobs – lots of jobs. Indeed, as seen below (and in Appendix 1), it could create good green jobs this year for tens of thousands of Albertans who have lost their jobs in the recession.

Alberta families, businesses, public agencies and non-profits all consume energy. By increasing energy efficiency in homes and buildings, they could all consume less energy, thereby reducing emissions and saving money that could then be spent on higher priorities.

Energy efficiency is one of the most attractive green jobs policies because the money saved on reducing energy consumption can cover the full costs of the investments, and then some. Also, the number of green jobs created by energy efficiency investments can be quite high.

Existing buildings: energy efficiency retrofits

Retrofitting buildings is a green jobs strategy that can be started immediately. There are no lengthy planning and implementation processes needed, and the technologies are already known: insulation, high-performance windows and doors, weather-stripping, high-efficiency heating and cooling systems and appliances, etc.

For public buildings, the jobs will come very quickly. The decision to spend the funds is all that is needed since there is no delay between announcing the availability of grants and the private uptake of those incentives. Investments in retrofitting public buildings can also reduce costs and thereby increase funds available to provide public services. For example, with hospitals the savings on energy costs can enable greater spending on patient care. For schools, the savings can enable greater spending on teaching and books.

The same financial considerations apply to commercial building upgrades. Reducing energy expenditures allows firms to spend more on new production and services and on boosting productivity. However, the policy mechanism for getting the upgrades done will be different. Instead of direct government spending, it requires the building owners to invest in the upgrades.

To encourage homeowner and non-profit investments, the most straightforward policy option (and thus most likely to be taken up) is grants to cover all or part of

the costs of the energy efficiency investments. Grants and subsidies are the most commonly used type of financial measure to encourage energy efficiency measures in the European Union.[125] These investments will include assessments to prioritize cost-effective retrofits, the installations themselves, and audits to confirm the results.

Grants can also be used to encourage retrofits of some commercial buildings, though this would be the exception rather than the rule. More appropriate to businesses would be tax credits, loans and loan guarantees that would be paid back out of the energy cost savings.

"A growing number of companies are implementing green retrofits of their buildings to save money, improve productivity, lower absenteeism and health care costs, strengthen employee attraction and retention, and improve their corporate sustainability reports and brand equity – all at a relatively modest cost. However, timing is important for companies seeking to use green retrofits as a point of competitive differentiation. The earlier a company performs a green retrofit, the more differentiation it stands to gain."

- Deloitte, "The Dollars and Sense of Green Retrofits"[126]

Grant financing of upgrades

The provincial government can afford to provide grants for home energy retrofit grants that would enable insulation, weather-sealing and other efficiency improvements for every Alberta household that needs them (see Appendix 1).

Of course, grants aren't needed by everyone. Albertans in the top 10 per cent of incomes (incomes over about $200,000 per year) don't need the rest of the public to support their up-front cash flow. The payback from these energy efficiency investments can be used to cover their costs. If needed, loan financing (see below) can help cover the up-front costs.

The aim in distributing such home efficiency upgrade grants should be to pick the low-hanging fruit – the low-cost, high-gain upgrades – rather than producing a smaller number of environmental show homes. This will maximize energy savings and emission reduction per dollar spent.

Based on the number of houses that likely need energy efficiency upgrades, the total cost would be roughly $900 million to $1.9 billion (see Appendix 1). While significant, this pales next to the $4.5 billion of subsidies recently handed to the fossil fuel industry. [127]

This investment, apart from lowering homeowner energy costs and emissions, would create roughly 10,000 to 22,000 direct and indirect jobs, or 13,000 to 28,000 jobs if we include induced employment.

In addition to the direct, indirect, and induced employment noted above, there is also the employment impact of the homeowner savings. If homeowners were to save even a few hundred dollars per year,[128] every year for many years, there is likely to be significant spending elsewhere in the economy, which will in turn create more jobs. Assuming the time required for energy savings to cover the costs of the efficiency upgrades is 10 years, this energy savings re-spending would mean $91 million to $194 million going to Albertans every year, creating more jobs.

Houses weatherized under the U.S. Weatherization Assistance Program yield energy savings of $400 to $500 in their first year, and continue to pay back for many years. For every dollar spent, the WAP returns $2.72.[129]

Finally, it is very likely that with such a massive increase in energy efficiency upgrades in Alberta, manufacturing industries supplying that market would be developed here, employing even more Albertans. As other provinces and states proceed with their energy efficiency programs, Alberta manufacturers would likely end up becoming exporters, thus creating more jobs, over the medium term and long term.

Considering the added direct, indirect, and induced jobs, and the employment from energy savings re-spending and the development of energy efficiency manufacturing industries, the provincial government would re-capture a significant sum from its initial investment in income tax and corporate tax revenues.

The provincial government recently eliminated its natural gas subsidy to consumers, which had provided $2 billion over the past six years.[130] This would more than cover the cost of upgrading the energy efficiency of every home in Alberta that needs it. And those upgrades would save the homeowners twice as much as the gas subsidy did.[131]

Loan financing of upgrades

As noted above, loan financing could be used to provide the up-front costs for households with high incomes and commercial buildings. Given the relatively brief payback time for building energy efficiency upgrades, commercial financing should be able to facilitate upgrades for most firms and for the wealthy individuals who do not qualify for grants.

Loans for municipalities to upgrade their buildings can also be provided by an Energy Efficiency Loan Fund within the Heritage Fund. The upgrades will add value to the properties, and this added value can provide security for the loans. The Heritage Fund would be acting as a source of patient capital, with long-term investments building green jobs at home instead of risking losses on global capital markets.

"In 1995, the City of Edmonton created a revolving fund aimed at energy retrofits of City facilities. This fund initially started at $1 million dollars and was increased in 1999 to $5 million. In 2002, City Council approved an increase in the fund limit of up to $30 million, to be financed from the Alberta Municipal Finance Corporation (AMFC).

The $30 million fund is set aside for energy efficiency projects such as upgrades to lighting, heating, cooling and ventilation systems and envelope upgrades. The amount borrowed against the fund for these projects is repaid over a period of up to eight years (up to 10 years by exception) out of the utility savings making this money available for other energy projects."

– City of Edmonton, "Energy Management Revolving Fund" [132]

Audits and upgrades for homes and buildings being sold

The grant and loan programs discussed above could result in all Alberta households and commercial buildings having improved energy efficiency. However, some owners and occupants may choose not to avail themselves of this assistance, with the result that buyers of existing homes and buildings could end up with energy lemons.

Buyers can be protected (and efficiency increased) by requiring that an energy audit be included in all real estate listings and to prospective buyers. The audit could be an existing one or a new one, but it would need to include practical information for buyers, including the costs of space and water heating for the past few years along with average costs for comparable structures, and information about any recently completed upgrades.

In the future, the property transfer requirements could be notched up to require that all homes and buildings sold meet at least average levels of energy efficiency (or get an upgrade). With grants being available to all homeowners who need them, and energy savings providing an additional incentive, such requirements should be easily met. Cities across the United States are implementing strategies like these to protect property buyers and reduce energy waste.[133]

Another strategy to support ongoing energy efficiency improvements is adjusting the rate schedule for energy used. Average and near-average levels of energy consumed would continue at regular prices, while a premium billing rate per unit would kick in at high levels of consumption. This would provide an added incentive for owners of energy lemons to avail themselves of the financing available for upgrades. It would also protect frugal energy users from having to pay more for system upgrades made necessary by excessive users. The new rates could be introduced a year after the upgrade program has been running, to allow time for upgrades to be completed.

These changes would result in an ongoing improvement of the building stock in Alberta, protect buyers, and reduce long-term energy costs and emissions. It would also help to create long-term employment in Alberta.

New buildings: greening the building code

It is more cost effective to build energy efficiency into new buildings, rather than retrofitting them after the fact. So it makes sense to improve the standards for new buildings such that those buildings will be adequate to our energy efficiency needs 20 to 40 years into the future, and not just today.

The increased costs of the more efficient new buildings can be recouped in just three years through energy savings.[134] Not surprisingly, a recent study found that 93 per cent of buyers expect builders to offer energy-efficient features as a standard feature rather than an upgrade.[135]

> "Decreasing energy use is the smartest, cheapest and cleanest way to meet electricity demand." [136]

The building code sets construction standards for new homes and for some major renovations. The code can be improved to require higher standards for insulation, window and door performance, heating and cooling system efficiency etc. Ontario's building code incorporated an "EnerGuide 80" standard, which will mean improvements in wall and ceiling insulation and window and furnace efficiency. These improvements will reduce GHG emissions by an amount equal to removing 250,000 cars from the road.[137] LEED-certified (LEED: Leadership in Energy and Environmental Design) standards could provide another benchmark for an Alberta building code amendment.[138]

Furthermore, public building standards can be moved to a higher LEED standard. In May 2006, the provincial government adopted the Silver LEED standard. This has increased new building costs by up to 5 per cent, but this is offset by lower operating costs, as energy efficiency is improved by up to 45 per cent.[139] Furthermore, it has helped to showcase and bolster Alberta's green building industry. Public building standards could be notched up to the gold LEED standard, with a view to increasing to the higher platinum level in a few years. Building to this standard would put more Albertans to work, demonstrate the value of green building practices, and save energy.

With the adoption of such policies, a clear signal would be sent to several industries that supply energy efficiency

products. Knowing that there would be a market in Alberta, they may well choose to establish manufacturing facilities here. If Alberta got out of the gates ahead of other jurisdictions, it could have a more diversified industrial base and end up with a new set of exports – exports that will be in greater demand in the future.

Representative jobs

Representative jobs in this area include: electricians, heating/air conditioning installers, carpenters, construction equipment operators, roofers, insulation workers, carpenter helpers, industrial truck drivers, construction managers, building inspectors, and sheet metal workers.[140]

Expand transit and create high-speed rail

A key driver of greenhouse gas emissions is excessive automobile use, and Albertans are big users of automobiles. Alberta leads all provinces in the per centage of households owning a vehicle, in the per centage of households owning two or more vehicles, and in the level of average gasoline consumption.[141]

To some extent, automobile use is driven by subsidies to fossil fuels, roadways and automobile manufacturers (subsidy reform is addressed below). However, a major challenge in reducing automobile use is the lack of alternatives, especially the lack of high-quality public transit. Lack of alternatives creates automobile dependency.

Transit

Transit service requires density of ridership in order to be efficient. Unfortunately, we have allowed Alberta's cities to become dominated by low-density sprawling suburbs surrounding tiny downtown cores. Alberta has some of the most sprawling cities and lowest densities on the continent.

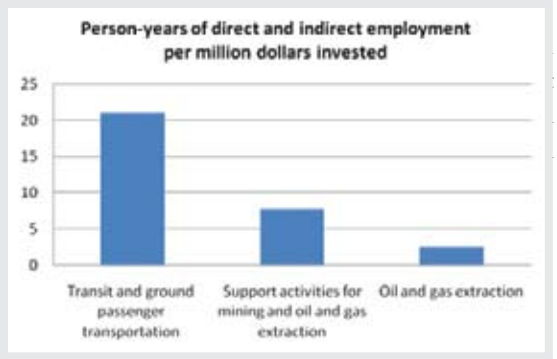
"Western Canadian cities are typically characterized by extensive urban sprawl, manifesting low density development which makes it extremely challenging for city planners to put in place the public transit systems that are necessary to ensure the efficient operation of urban areas."

– Canada West Foundation[142]

However, this doesn't mean that transit cannot be made to work. For one thing, transit can and does work well in the areas of cities where there is sufficient density. In addition, transit can help to shape new development and re-shape existing communities. LRT and subway systems, for instance, create pockets of higher density at their stops. Bus lines and street cars create ribbons of higher density along their routes. High quality transit

raises the value of nearby land, thus attracting more development and density. In turn, this increased density can make transit systems more efficient, alleviate the demand for automobile use, and reduce the costs of building the system itself.[143]

So establishing good transit systems can provide automobile drivers with an alternative, and in the long-term can rein in sprawl and reduce automobile dependency. And of course, building good transit systems can put people to work.



Data source – Alberta Economic Multipliers[144]

Of course, transit investments should be made where they will be most effective at reducing automobile usage, and this is generally in cities. Both larger cities and smaller cities operate bus systems, and these systems can be improved immediately by accelerating the repair and rehabilitation of bus fleets. This will increase service hours by maximizing fleet usability, thereby ramping up ridership, and paving the way for a more efficient, expanded system in future years.

Physically separated bus-only lanes can also be built to create express rapid-bus systems and improve service quality. Ottawa's Transitway system now forms the backbone of the Ottawa transit system and carries 240,000 passengers per day.[145] Rapid bus systems have been built in many countries.[146]

Edmonton and Calgary have very modest LRT systems. They can be expanded much more quickly than they have been in the past. In order to help shape development in the next decade, those systems should be expanded quickly. It would be appropriate to accelerate any construction that could be carried out in the short term. In addition, planning routes and acquiring known rights-of-way can be done in the short term, while property values are down. This would send clear signals to private investors and encourage the density and development that is needed to make the lines cost effective.

The City of Calgary has signaled that it intends to increase transit service hours by 300,000 hours by 2012. It also plans to expand its LRT system to include a new western leg,[147] as part of a job-creating stimulus package,[148] which will be operational by 2012. Edmonton also has LRT expansion plans, with a south extension currently being built and three other routes currently in planning.[149x]

A recent survey of Canadian transit system operators found that a $40 billion investment was needed over a four-year period to repair existing infrastructure and build new infrastructure to meet demand.[150] Another study examined the economic need for transit in Canada, and recommended a major investment in order to reduce congestion, make mobility more affordable, and spur community development. That study found that an economically optimal investment would be $71.3 [billion?] in capital spending (over five years), and $48.4 billion in operations and maintenance (over 30 years). This investment would generate economic benefits of about $239 billion.[151]

These two studies – one being a ground-up assessment of needs of existing transit systems, and the other being a top-down economic analysis of optimal transit delivery – provide a fairly consistent picture of the investment need. Assuming that this need is distributed evenly across Canada,[152] the investment in Alberta would be in the neighbourhood of $4-$7 billion over four to five years. Using a mix of construction, repair, transit and other multipliers,[153] this would create roughly 49,000 to 86,000 direct and indirect jobs, and a further 15,000-26,000 induced jobs.

"In many ways, this is a 'golden era of opportunity' for urban transit in Alberta. The increase in traffic congestion in our major cities leads one naturally to think of transit as a way out of the gridlock ... Even if we could afford it – which we can't, as a province and as individuals – our traditional reliance on the automobile is not sustainable in the long run. … The cars, trucks, vans and SUVs we drive are part of the problem – and public transit must be part of the solution."

– Alberta Premier Ed Stelmach[154]

Edmonton-Calgary high speed rail

In addition, there has been discussion of the potential for intercity high-speed rail on the Edmonton-Red Deer-Calgary corridor. Automobile traffic and flights between Calgary and Edmonton are time-consuming, energy-inefficient, expensive, and polluting. High-speed rail would provide a significant improvement on all counts, while providing tens of thousands of jobs.

Studies have been conducted on the viability of such a rail link. The most recent, a study for the provincial government, was carried out in 2007[155] and has not yet been released. An earlier study for the University of Calgary's Van Horne Institute concluded that such a link would be commercially viable. It would create 25,500 to 52,000 jobs in construction and an additional 2,700 to 4,050 jobs related to rail operations and enhanced economic development.

Overall, the Van Horne study found the link would cost $1.7 billion to $3.4 billion, and create $3.7 to $6.1 billion in quantifiable benefits (tax revenues, employment income, travel time and cost savings, accident reduction, environmental benefits) in addition to other benefits that are difficult to quantify (unifying the region economically, improving its competitiveness, reshaping growth and development, diversifying the economy, increasing knowledge-based, high-value jobs, and improving access to Calgary and Edmonton airports).

On the preferred route (the lower-cost one employing the existing CPR alignment), projected ridership and revenues would be expected to cover operating costs, and repay capital costs plus 35 per cent within 30 years.

Calgary Mayor Dave Bronconnier said, "I do think it's an idea whose time has come. If you look at it from an economic perspective linking Calgary, Red Deer and Edmonton together with Calgary's International Airport, it truly provides a significant air, transportation and rail link in Calgary."[157]

Roger Gibbins, president of the Canada West Foundation, termed the idea an "opportunity in this province to make a transformative investment" and noted a "surprising degree" of public support for the project.[158] A Leger Marketing poll for the Calgary Herald found that 67 per cent of Albertans believe the government should invest public money in the project.[159]

Premier Ed Stelmach called the project essential and "visionary" and said the government has "no choice" but to build it. He made the remarks in 2007, when the economy was overheated, and prices for labour and materials were high and getting higher. The economic conditions at the time clearly were not the best for major government spending, as it would have served to drive inflation, and he commented, "We will be connecting the two major centres. When exactly, I don't know. But it is part of the long-term future of the province of Alberta."[160]

Now that the economy has cooled down and is in need of stimulus spending, and labour and materials are highly available and cheap, the timing would appear to be perfect.

Representative jobs

Representative jobs in this area include: civil engineers, rail track layers, electricians, welders, metal fabricators, engine assemblers, bus drivers, dispatchers, locomotive engineers, railroad conductors, and front-line transportation supervisors.[161]

Accelerate renewable energy development

"We are currently facing a third economic revolution, a revolution which, after the industrial and technological revolutions, will consist of the transition from an economy dependant on carbon to an economy based on renewable energy."

- José Luis Rodríguez Zapatero, prime minister of Spain[162]

Fossil fuels are non-renewable, and are not going to last forever. They are a transition fuel, rather than the permanent fuel of the future. In other words, they will support some of our energy needs as we transition toward renewable energy and help pay for that transition. With this in mind, the step that must be taken now is to implement the policies that will ease our dependence on fossil fuels and begin the transition toward renewable energy.

"The [Newfoundland and Labrador Energy Plan] will see the province investing revenues from non-renewable resources into developing a renewable resource economy, powered by hydro, wind and other green energy sources."[163]

Fortunately, renewable energy development creates far more jobs per dollar invested and per unit of energy obtained than fossil fuel energy. Wind creates up to three times as many jobs as coal-fired and gas-fired electricity, and solar creates as much as ten times as many jobs.[164] As noted above, Spain, Germany, and the U.S. are growing out their renewable energy industries quickly, and Ontario and PEI are following suit.

Albertans would strongly prefer to see public investments directed to job creation in the renewable energy sector, rather than in the oil and gas sector. A recent Ipsos-Reid poll shows that 78 per cent of Albertans asked about job creation prefer subsides for renewable

and clean energy options in the future while only 11 per cent prefer subsidies for oil and gas development. [165]

Ontario's installed wind power capacity has grown more than 6,000 per cent since 2003 [166]

Several policies can be adopted to help in the transition to renewables, including:

Renewable energy portfolio standard. The Alberta grid carries electricity from many different sources, about 90 per cent of which is fossil fuels (primarily coal, and natural gas).[167] Renewable portfolio standards require utilities to purchase specified per centages of total electricity from renewable sources, like wind, solar, and geothermal. The per centage increases over time according to a schedule, and has targets in the short, medium and long term. This would give potential renewable energy producers the confidence they need to invest in building production capacity, and would thereby generate employment in developing more renewable production capacity.

California legislation requires electric utilities and providers to source at least 20 per cent of their electricity from renewables by 2010, increasing by at least 1 per cent every year. On November 17, 2008, Governor Arnold Schwarzenegger signed an executive order requiring that California utilities reach 33 per cent renewables by 2020.[168]

88 per cent of Canadians support provincial governments requiring that a specific portion of electrical energy come from emerging renewable sources like wind and solar.[169]

Renewable energy tariff. These tariffs (also called feed-in tariffs) require electrical utilities to pay a premium price for electricity generated from renewable sources. Germany has had tremendous success with its tariff, rapidly building its wind and solar sectors and creating a local economic revival,[170] and Ontario is introducing its own tariff.[171] This policy instrument doesn't require government spending, as the cost would be spread over the rest of the electricity on the grid.[172] It gives potential renewable energy generators the confidence they need to invest in building production capacity, and would thereby generate long-term employment in developing more renewable production capacity.

A month after the Green Energy Act was introduced to the Ontario legislature, Everbrite Industries announced a plan to build a solar cell manufacturing plant in Kingston, Ontario. The plant will create 1,200 direct and indirect green jobs in the area. The CEO of Everbrite said that Ontario's new pro-renewable policies are expected to create enough local demand to justify the investment in a manufacturing facility." [173]

Fiscal incentives for renewable energy development. Tax reductions, loans, loan guarantees, and grants could help accelerate renewable energy development and spark job creation. The Alberta government's Climate Change and Emissions Management Fund,[174] which is funded by a modest industrial carbon tax on excess emissions,[175] could provide these incentives over the long term. In addition, a reliable source of up-front financing would give the private sector adequate assurance to make investments. A Renewable Energy Loan Fund within the Heritage Fund could provide revolving loans. An initial $1.5 billion allocation would make it comparable to the renewable investments fund in Alaska.[176]

Smart grid. One potential challenge for renewable energy is the capacity of the grid to deal with renewable energy inputs, which are variable depending on the weather. The U.S. government is planning to invest billions in upgrading their grid, making it more efficient and enabling it to accept more renewable electricity input. Energy storage is another solution.[177] Such investments in Alberta would create a range of employment possibilities.

Renewable electricity micro-generation. By putting rooftop renewable electricity generation on public buildings, government can employ installers and spur development of the renewable generation supply sector. In 2006, solar photovoltaic (PV) panels were installed on 20 municipal buildings across Alberta as part of a showcase project[178] and real-time, live data on the power captured at each site is available online.[179]

Remote First Nations communities are also good candidates for solar power, which can generate rural green jobs. First Power is working to install thermal solar and other technologies with First Nations, while providing culturally appropriate training and handing over jobs to community members.[180]

Renewable energy procurement. The provincial government has gone a good distance towards green energy procurement, already buying 90 per cent of its electricity from renewable sources.[181] Taking the final step and ramping this up to 100 per cent would, with other policies, send a signal to the renewable energy industry that the government is committed to expanding renewable energy, and that they should invest in increasing capacity and employing Albertans in green jobs.

Ban on new carbon-emitting electricity generation. The province of British Columbia recently instituted a policy prohibiting development of new generation capacity that would emit greenhouse gases.[182] Alberta can, and should, follow suit.

"The government has made a commitment that all new electricity generation projects developed in British Columbia and connected to the grid will have zero net greenhouse gas emissions. In addition, any new electricity generated from coal must meet the more stringent standard of zero greenhouse gas emissions."[183]

67 per cent of Canadians say all new demand should be met with renewable energy sources.[184]

How many green jobs will a shift toward renewable energy create? The answer depends on how much of our current fossil fuel energy requirements we can replace with renewables, and whether we establish a renewable technology manufacturing industry here.

Spain has grown its wind energy industry enormously in the last several years. From less than 3,500 MW installed capacity in 2001, it grew more than four-fold to over 15,000 MW by 2007. The industry now employs 45,000 people.[185]

China's renewable energy sector has grown quickly; in just three years, overall capacity has grown by five times over to over 5,000 MW.[186] China's aggressive investments are enabling it to build its own domestic wind industry, and that industry's growth is outpacing imports, having grown from supplying only a quarter of installed capacity to over half in three years (while total capacity grew five-fold).

Growth in China's Wind Energy Sector

- Global Wind Energy Council [187]

By comparison, Alberta's total installed wind capacity in 2007 was 496 MW. However, a further 11,000 MW of projects are under consideration, though it is unlikely that all of those projects would be developed. The untapped capacity of Alberta's wind power is much higher, estimated at 64,000 MW.[188]

> "Although Alberta was Canada's leading wind energy producer for many years, in 2008 both Ontario and Quebec surpassed it. In spite of 15 years of wind development, Alberta still takes advantage of less than 1 per cent of the estimated total wind energy potential in the province."[189]

It is possible to satisfy all projected future increases in demand for electricity in Alberta using a combination of efficiency gains and renewable electricity production. Moreover, as a recent Pembina Institute study pointed out, it is possible to phase out existing coal-fired generation in the next 20 years. Although technology is improving continually all of this can be achieved using existing technology.[190]

The Pembina study suggests that wind power in Alberta could be ramped up to 23,000-28,000 GWh per year by 2028. Sustaining this capacity would create the better part of a thousand permanent jobs in operations and maintenance of the wind turbines.[191] Moreover, there is a much larger employment opportunity in building the wind turbines. The majority of jobs created in the renewable energy industry are in manufacturing and construction, not in operations and maintenance.[192]

If Alberta establishes a wind turbine manufacturing industry here, it stands to gain 29,000 to 200,000 jobs in building and installing the turbines needed – based solely on the domestic market.[193]

Alberta gets a good deal of sunshine, and southern Alberta is among the sunniest of areas in Canada. The solar photovoltaic (PV) industry can also be grown significantly, creating more green jobs from renewable electricity. Ontario, with its new feed-in tariff, is committing to significant growth in solar PV.[194] In Germany, there are already 45,000 jobs in the sector, and Spain, France, Italy and Greece are adopting Germany's feed-in tariff policy.[195] With Alberta's sunnier conditions, a comparable solar industry here could employ roughly 1,000 to 2,000 people – again just supplying the domestic market.[196] However, Alberta could well exceed Germany's solar output and green job creation in that sector if it takes strong policy steps.

It is possible that once Alberta's renewable energy equipment manufacturing industry is established, other provinces will place orders in Alberta instead of placing them overseas. This could provide further manufacturing jobs here. As noted earlier, one California study found that a renewable energy industry serving the export market can create 16 times as many jobs as an industry only serving the domestic market."[197]

This is an instance in which Alberta needs to choose quickly between being a leader in the green energy economy and being a follower. If we act soon we can establish the manufacturing industry here, instead of being an importer. However, if Alberta waits for long on the sidelines, it won't have those good, green manufacturing jobs. If Alberta gets into the game too late, it will be importing the generation capacity and exporting the jobs.

Alberta should therefore send a strong, clear policy signal that it intends to rapidly build a renewable energy manufacturing industry. It should:

- fast-track renewable energy development applications currently in the queue;
- set renewable energy targets that would achieve at least 25 per cent renewable electricity by 2028, with a schedule of shorter-term targets that would demonstrate meaningful progress toward the 2028 goal;
- create a renewable energy tariff that provides a financial incentive to develop solar, wind and geothermal energy resources such that Alberta is a world-leader in renewable energy;
- ban new carbon-emitting energy projects, in order to spark new clean energy projects and send a clear signal to investors; and
- establish a crown corporation – the Alberta Renewable Energy Corporation – to accelerate the development of renewable energy manufacturing capacity in Alberta (as done with previous Alberta crown corporations for the fossil energy sector). The crown corporation would immediately purchase inputs and begin to build the renewable manufacturing infrastructure. It could be operated on a commercial basis in order to allow competition with private sector players that want to enter the field and build the capacity further.

Renewable energy is the energy of the future. Alberta's vision of the renewable energy sector should be comparable in ambition to its development of the fossil energy sector. It should build the sector quickly, and ensure that as many good jobs as possible are created here.

Representative jobs

Representative jobs in these areas include the following:

- Smart grid: computer software engineers, electrical engineers, electrical equipment assemblers, electrical equipment technicians, machinists, team assemblers, construction labourers, operating engineers, and electrical power line installers and repairers
- Wind power: environmental engineers, iron and steel workers, millwrights, sheet metal workers, machinists, electrical equipment assemblers, construction equipment operators, industrial truck drivers, industrial production managers, first-line production supervisors, and assemblers.
- Solar power: electrical engineers, electricians, industrial machinery mechanics, welders, metal fabricators, electrical equipment assemblers, construction equipment operators, installation helpers, labourers, and construction managers.[198]

Create other green jobs

There are several other areas where the government should make green jobs investments, and implement other green jobs policies.

Provide water treatment for First Nations communities. First and foremost, rural First Nations communities need safe drinking water and effective wastewater treatment systems. Many don't have these facilities, or they are badly in need of upgrading. Building the needed systems will create many jobs, especially in rural First Nations communities, where they are needed. A hiring policy for such jobs should give preferential access to First Nations people.

Improve wastewater collection and treatment. Calgary and Edmonton have good sewage treatment systems compared to those in some other parts of Canada. However, there are large areas of the province with limited sewage treatment; in some areas the per centage of population without sewage treatment reaches 75 per cent-100 per cent.[199] The provincial government should immediately begin to provide and repair wastewater treatment systems where priorities are known, and conduct a province-wide review to identify other priorities. Furthermore, with Alberta's water resources increasingly threatened by industrial extractions and global warming, existing wastewater collection and treatment standards should be upgraded, planning for improvements well into the future. Upgrading Alberta wastewater treatment systems would create thousands of green jobs in construction, engineering, maintenance, and repairs.[200]

Replant forests. An accelerated reforestation program can create green jobs in hard-hit forestry communities. At the same time, it can reduce our global warming impact (trees absorb CO2 while growing), and assist in the recovery of clearcut watersheds. Immediate reforestation should be required of any forestry company as a condition of logging, and where any company fails to do it, this work should be financed publicly and recovered against current and past owners and operators of forestry operations.

Clean up contaminated sites. Often land in urban centres requires remediation before it can be built upon. Slow progress on remediating such sites leads to development at urban margins, and more sprawl. A public investment in remediating such properties can create many green jobs, with the costs being recovered against the increased property value of improved land.

Abandoned oil and gas well sites across rural Alberta create environmental and human health risks. A major public investment in remediating and sealing off all those sites in the next 12 months could create many green jobs in rural Alberta. The provincial government recently announced some funding for such cleanups,[201] however, it is not clear what the total liability is for the cleanups across Alberta. Work should begin immediately on all known priority sites, while an inventory identifies other sites in need of work. Again, the costs of the work done should be recovered against the current and past owners and operators of the well sites.

Eliminate environmentally-harmful subsidies. A key step to a greener economy and more green jobs is to eliminate environmentally harmful subsidies, also known as perverse subsidies. The biggest perverse subsidies are those given to fossil energy companies, and those that encourage excessive road use. Removing these and other such handouts will allow greener industries to attract investment dollars, expand and hire more people. It also will free up public funds for investing in green job creation. See Appendix 2 for a further discussion.

Reduce greenhouse gas emissions. As noted earlier, the mainstream conversation about global warming has moved on, and is now focused on which policy instruments should be used to fix the problem. There are three main classes of instruments to choose from: regulation, cap-and-trade, and carbon taxes. Each can reduce GHG emissions, and each would create a price on carbon emissions. For the purposes of green jobs creation, those instruments that create revenue streams for investing in green industries would be best. This means either cap-and-trade with the auctioning of permits or carbon taxation. Either of those options would provide revenues to pay back the up-front cost of public investments in green job creation. In the end, however, Alberta and Canada only have a small window to influence global warming policy. The U.S. government has clearly signalled that it intends to move quickly and decisively in this area. If we don't make the choice here, it will be made for us. For further discussion of reducing GHG emissions, see Appendix 3.

Buy locally, buy green. In addition to its purchase of renewable energy, the provincial government should adopt local and green purchasing policies in all areas. This will help build markets for green, local production in a wide range of sectors, and create green jobs for Albertans.

The above policies are merely indicative; they are not a complete list of all the policy changes that are needed. What Alberta needs is a broad, comprehensive shift in incentives to build a strong green jobs economy now and into the future.

Meet the skills demand – education, training and transition

Shifting to a green economy is going to create a major demand for workers in Alberta – tens of thousands of them. As noted earlier, some of these workers will be employed in entirely new jobs.Many others will be in familiar occupations, but applied to new purposes and thus requiring new skills. Education, training (including apprenticeships), and transition programs will be required in order to help the workforce supply the demand for new knowledge and new skills.

> "The [U.S.] National Renewable Energy Lab has identified a shortage of skills and training as a leading barrier to renewable energy and energy efficiency growth."[202]

The type of training and education required for the green economy will range across a broad spectrum. There will be brief and focused applied training programs aimed at adding new knowledge to existing skill sets (e.g. builders training on weatherization and installation of solar panels) and there will be educational programs, ranging from elementary school to post-secondary, on understanding clean and renewable energy and how to design systems to harness it. There will also be much in between.

Programs should generally be delivered by agencies that already deliver educational and workforce development programs, taking advantage of their existing teaching and training expertise and administrative capacity. Green economy and green jobs content should be incorporated into existing programs where possible.

These agencies will be able to respond well to the clear policy signals proposed elsewhere in this paper. They will see that the government is serious about renewable energy, transit, and energy efficiency. As a result they will create many of the training programs needed, especially the ones in high demand, including energy efficiency upgrades and installation, operations, and maintenance of renewable energy systems.

These programs should include entry points for range of workers, including people recently laid off, people with longer-term unemployment, those underemployed or in minimum wage jobs, and students about to graduate. The programs should also have links to those doing training of at-risk people (youth or formerly incarcerated) to link them into the green jobs ladder.

Employers will be prompted by a mixture of financial incentives and regulation to provide apprenticeships and on-the-job training, focusing on unemployed workers.

Training programs will need to be linked with unions, professional associations, apprenticeship programs, green job non-profits, and industry contacts such as green architects, builders, engineering firms, and construction contractors. Such green job training partnerships will help ensure the programs are informed by current information that is relevant to real green jobs. These partnership will also help students to graduate in an occupational milieu rich with useful contacts, instead of just being shown the door when the program is done.

Furthermore, the programs need to be informed by regular labour market analyses, surveys of current green jobs, and projections of future industry trends in order to ensure that the programs match current and future green job market needs.

Public investment will be required to create the educational programs with a less direct connection to employment, and of course public funds should be provided to enable workers to pay for training programs, and to support them while they take the programs and find work.

The American Recovery and Reinvestment Act contains at least $1.15 billion specifically for green job training, in addition to larger amounts for general employment training and transition (about $5 billion) and education (about $17 billion).[203] A comparable investment in Alberta would be $12 million per year specifically for green job training. Given Alberta's fiscal position, which is far superior to that of the U.S., a larger per-capita investment could be made here.

Many jobs have been shed from the fossil fuel sector and other sectors, with workers being given little or no access to training, education or transition programs. In the context of a green jobs strategy, the failure to provide such program would be a false economy – a failure to invest in the future. The new green economy is going to need trained, knowledgeable workers, and effective programs will help provide them.

> "Smart investment means investing in the right skills for tomorrow's needs; investing in energy efficiency to create jobs and save energy."[204]

Create a provincial green jobs strategy

Overall, Alberta needs to develop a provincial green jobs strategy. The policy prescriptions laid out in this report should be considered a starting point, and clearly a comprehensive effort will be required to put Alberta on a track for a sustainable, good green jobs future.

Elements of the provincial strategy should include:

- As a conceptual starting point, the recognition that mandatory, real GHG emission reductions will be coming to Alberta in the near future and that fossil fuels will be treated – in public policy decisions – as a transition fuel, rather than the long-term future of the province.
- Detailed research on the job creation potential and costs of different strategies for reducing energy use and GHG emissions.
- Detailed research on what other countries are doing – both policies and their impacts – in respect to creating a green economy, green jobs, and training and transition programs.
- Setting firm and binding targets for making Alberta a leader in the green jobs economy of the future.
- Implementing the policies require to achieve those targets and make that future a reality.

While this strategy is being developed, we have to ensure that progress is made in creating green jobs to put unemployed Albertans back to work. The need to do a good and complete job should not interfere with getting started, implementing the policies needed, and carrying out the work that we know needs to be done.

Timing and shape of the green jobs transition

The transition to a green jobs economy can begin right away, and be sustained over the medium and long term.

Short term: invest in creating green jobs over the next two years

In order to be useful, stimulus investment needs to be carried out while the economy is in recession. There are predictions that the recession will last about a year, while others suggest those predictions are far too optimistic. In any event, it makes sense to plan green job stimulus investments to take place within the next year or possibly two.

In addition to these investments, during the first two years the government will need to put into place the policy instruments and take other steps needed to spur green job creation in the medium and long term.

Energy efficiency. In the short term, the biggest bang for the buck will be public investments in energy efficiency retrofits for buildings. Retrofits can be started now and the majority of the work can be done in one year. As noted above, an investment of $900 million to $1.9 billion would create roughly 10,000 to 22,000 direct and indirect jobs, or 13,000 to 28,000 jobs if we include induced employment. An additional job boost arising from energy savings re-spending would begin right away, and continue indefinitely. This aggressive push on energy efficiency will encourage the development of an energy efficiency manufacturing capacity in Alberta.

Transit and high-speed rail. Bus and rolling stock repairs and rehabilitation can be started right away and carried out within a year. The construction of separate rapid-bus routes can also begin right away, along with shovel-ready LRT expansions and high-speed rail stations[205] and track along existing rights-of-way. These projects would accelerate over the two years, and into the medium and long term. Assuming $3.5 billion of the $4-$7 billion of transit investments needed in Alberta in the next four to five years are made in the next two years, approximately 43,000 direct and indirect jobs could be created, along with an additional 13,000 induced jobs, for a total of 56,000 jobs.

Renewable energy. Renewable energy policies could be implemented right away and begin to spur development, though most development would occur in the medium to long term. In the short term, the Alberta Renewable Energy Corporation could begin to construct the needed manufacturing infrastructure, creating thousands of jobs.

Total short-term jobs and investment.

The majority of jobs created in the short term will be in the construction and related industries, the industries that supply them, and the sectors where jobs will be induced by worker spending. Based only on the efficiency upgrade, transit and high-speed rail numbers above, short-term job creation for this program would be about 53,000 to 65,000 direct and indirect jobs, and a total of 69,000 to 84,000 jobs including direct, indirect, and induced employment. These jobs would be spread over two years, thus creating a total of about 34,500 to 42,000 full-time jobs lasting two years.

The required investment would be about $4.4 billion to $5.4 billion. This investment would be offset by increased revenues from income taxes, and by reduced social assistance payments, subsidized housing outlays, and other costs.

Initiating renewable energy tariffs for solar, wind, and geothermal power will jump start investment in that sector, laying the groundwork for thousands of jobs in the future. Adding the investment in building renewable energy manufacturing capacity would add jobs and cost – about 11.5 jobs per million dollars invested.[206] Likewise, the development of an energy efficiency manufacturing industry would create additional jobs.

The government can make these investments immediately, and in the first two years can put 34,500 and 42,000 Albertans back to work reducing fuel consumption, our environmental footprint, and homeowner and business energy costs. Doing so would eliminate Alberta's anticipated net job loss for 2008-09.

Medium term: diversify and consolidate green jobs gains

In the medium term (three to seven years), the green jobs mix will shift. Construction workers engaged in building energy retrofits will shift over to working on transit development and renewable energy installation. Jobs will open up in manufacturing and other sectors.

Energy efficiency. Most of the green jobs in this area would have been created in the short term. A smaller number of ongoing retrofits would continue indefinitely, as housing stock turns over and regulatory requirements continue to raise the energy efficiency bar. Greener new building standards would also continue to bolster green construction jobs into the future. The early push on energy efficiency would have built an energy efficiency manufacturing sector, and this sector could now be filling orders from other markets.

Transit and high-speed rail. Bus and rolling stock repairs and rehabilitation backlogs would have been cleared in the short term and would decline to maintenance levels. However, as services and fleets expand the maintenance level would rise. Construction of separate rapid-bus routes, along with LRT expansions and high-speed rail construction, would accelerate dramatically after planning and approvals stages are completed in the short term. Another $3.5 billion investment in transit would create approximately 43,000 direct and indirect jobs, along with an additional 13,000 induced jobs, for a total of 56,000 jobs. The construction of the Edmonton-Calgary high-speed rail link would create a further 25,500 to 52,000 jobs in construction. A further 2,700 to 4,050 further jobs would be created related to rail operations and enhanced economic development (likely the LRT expansion would create similar additional jobs, but for the purpose of this calculation they will be excluded). Using the top of the cost range provided by the Van Horne Institute study would peg the high-speed rail investment at $3.4 billion. So the total investment of $6.9 billion in transit and high-speed rail would create around 80,000 to 110,000 jobs in the medium term, plus a few thousand additional permanent jobs.[207] Spread out over the five years, this would be a total of 19,000 to 26,000 jobs.

Renewable energy. Renewable energy would also begin to take off in the medium term. The renewable energy tariff established in the first two years would have already sparked investment and the installation of wind turbines, solar panels, and geothermal systems, and those installations would continue to grow in the medium term. After initial installations using imported equipment in the short term, the demand for more equipment would drive growth in the local renewable energy technology manufacturing sector. The Alberta Renewable Energy crown corporation would have completed construction of facilities needed to manufacture the equipment here,

and production will begin early in the medium term, and grow significantly throughout and into the long term. Servicing the market in solar and wind power would create about 30,000 to 200,000 green jobs by 2028. Within the medium term (to year seven), perhaps 5,000 to 30,000[208] jobs would be created, with a higher number in the long term.

Total medium-term jobs and investment.

The jobs created in the medium term will be in a wider variety of sectors. Construction will still be a significant piece of the puzzle, but many other areas will grow, including manufacturing.

According to most economic commentators, the recession will be over, or at least easing, in a year or two. Thus, there would be a reduced need for total stimulus in the medium term; as the economy picks up, some of the jobs lost in 2008-2009 would be recovered in other sectors. However, there are some commentators who argue that the recession could go on for many more years more, and the growth of the tar sands is expected to slow down for several years compared to previous projections.[209] Some stimulus is therefore advisable for this period, albeit at a lower level than what is required in the short term.

Based on the transit and high-speed rail and the growing renewable energy field, roughly 85,000 to 140,000 green jobs would be created during this five-year period, plus a few thousand additional permanent jobs. This means a mean average of about 20,000 to 32,000 green jobs spread over the five years. During that period, renewables would ramp up, and transit and high-speed rail construction would continue throughout, ramping down toward the end.

These jobs would be generated by a combination of public investment and other policy instruments. The public investment would be mainly in transit and high-speed rail, totaling about $6.9 billion. Some of this investment will be recouped through higher income tax revenues and transit and train revenues, reduced need to spend on road and highway expansion, and the health care costs of excessive road use.

Long term: a mature green jobs economy

In the long term (eight to 20 years), Alberta will have a mature, diverse green jobs economy, which will be much better able to weather any economic storms. This economy will be characterized by a strong manufacturing sector focusing on renewable energy and energy efficiency products.

Transit improvements, renewable energy installations, and energy efficiency upgrading would continue to provide thousands of jobs. In addition, Albertans in rural areas will increasingly have jobs in sustainable agriculture and sustainable forestry.

The policies that will have built this mature green jobs economy will include the public investments from the short- and medium-term stages and the GHG reduction and other environmental policies. Fiscal surpluses, coming partly from energy cost savings, a diversified and stable economic base and secure jobs, and carbon pricing,[210] will have paid back the initial investments in the long term.

Alberta will also have a cleaner, healthier environment.

Summary: green jobs transition in the short and medium terms

	Short term: stimulus (years 1-2)			Medium term: diversify (years 3-7)		
	Person-years employment*	**Jobs over the term***	**Public Investment $ billions**	**Person-years employment***	**Jobs over the term***	**Public Investment $ billions**
Energy efficiency upgrades	13,000-28,000	6,500-14,000	0.9-1.9	#	#	#
Transit and high-speed rail	56000	28000	3.5	80,000-110,000‡	19,000-26,000	6.9
Renewable energy	#	#	#	5,000-30,000	1,000-6,000	-
Total	***69,000-84,000***	***34,500-42,000***	***4.4-5.4***	***85,00-140,000‡***	***20,000-32,000***	***6.9***

*Direct, indirect and induced.

‡ Plus 3,000-4,000 permanent jobs.

Not calculated because low numbers compared to others in the table (but not insignificant).

Conclusion

There is a global movement toward policies that create green jobs. In part these policies are aimed at addressing the current economic crisis and the unemployment it has created. Worldwide, millions of jobs are being created in green industries.

However, this movement is also important in steering the economy onto the long-term track that we all know it needs to be on – one that allows for prosperity without undermining the environmental foundations of the economy.

The new administration in the United States, Alberta's biggest customer, has made it clear that it takes global warming seriously, and is looking at its suppliers and the greenhouse gas emissions arising from their energy exports.

All this points to the fact that Alberta needs to start enacting the policies that will create good, green jobs.

We need to move beyond green rhetoric, and take serious steps toward the green economy of the future. The benefits will be many – from reducing homeowner and business energy costs to reducing automobile dependence to developing our clean energy resources, as we know we must.

We will also put tens of thousands of Albertans back to work in good green jobs.

The costs of doing so are remarkably affordable. Indeed, they are very close to the level of subsidies that the fossil fuel industry has received in recent years. The major difference, however, is that investments in the green jobs sectors create far more jobs dollar for dollar than oil and gas subsidies.

The Alberta government needs to get started immediately. There are real people who have lost their jobs and need good jobs. We need good, green jobs, and we need them now.

We need to create a true vision of Alberta as clean energy superpower – not just in words, but in deeds. Imagine what it would do for our markets and our national and global credibility. Instead of constantly being on a defensive game of public relations, advertising, lobbying in Washington, and re-branding, we could stop playing games altogether and persuade others by our genuine leadership and our on-the-ground results.

That is a bold project, but Alberta has always been known for doing bold things.

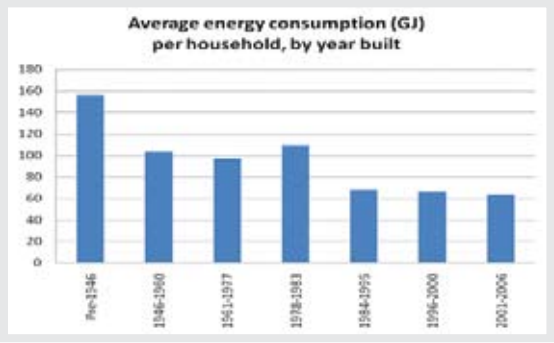
Appendix 1

Home energy efficiency: employment and investment

The aim of this appendix is to generate a rough estimate of the number of jobs created by, and the cost of, providing an energy efficiency upgrade for every household in Alberta that needs it.

Homes to upgrade

There are approximately 1.3 million households in Alberta,[211] about a third of which were built in the last 25 years (after 1983).[212] As the figure below shows, these newer houses – built after the oil shock of 1980 – tend to be more energy efficient. (Unfortunately, it appears that significant increases in efficiency did not continue after that.)



Source of data – Natural Resource Canada[213]

Of the remaining roughly 900,000 older households, if we assume about 20-40 per cent have been upgraded, we are left with between 540,000 and 720,000 older homes in need of upgrading.

Wealthy Albertans (the top 10 per cent, who make on average about $200,000 per year or more) probably do not need public assistance to finance their energy efficiency upgrades since they can presumably arrange the financing, and the savings from the energy efficiency will pay back their costs (and then some) within a few years. This would leave about 490,000-650,000 older homes.

Employment arising from upgrades

Providing an upgrade to each of these homes, assuming that it takes about five to eight person-days to complete an upgrade,[214] would translate to about 2.5 million to 5.2 million person-days, or 10,210 to 21,670 jobs to carry out the upgrades.[215]

Note that the job creation that would arise from this investment would also include induced jobs – the jobs created when the industry's workers spend their money. This would add another 3,100 to 6,800 jobs to the economy.

Note also that homes of wealthy Albertans were not included here. If other policies were applied to encourage their upgrades, the employment figures could be higher – perhaps 10 per cent higher (considering their larger homes), at no added cost to government.

Investment required and jobs created

The Alberta Finance economic multiplier tables do not include the energy efficiency upgrading industry, so an approximation of that industry needs to be constructed. For the purposes of this calculation, it will be assumed that the industry is comprised of a combination of construction, repair and maintenance, and administrative and support services.[216] This results in a composite industry employment multiplier, as shown in the table below.

Industry	Weighted per cent	Direct and indirect jobs per $10,000	Weighted per cent
Construction	60	0.082	0.0492
Repair and maintenance	30	0.155	0.0465
Administrative and support services	10	0.162	0.0162
Composite industry (direct and indirect) employment multiplier			0.1119

In this energy retrofit upgrade industry, a $10,000 investment would create 0.1119 jobs (11.19 jobs per million dollars, 11,190 jobs per billion dollars). Thus, creating 10,200 to 21,700 direct and indirect jobs in energy upgrades would require an investment of $912 million to $1.94 billion. Including induced employment, the jobs arising from that investment would be significantly higher, at 13,400 to 28,400.

As a check on this rough estimate, another way to calculate the cost of such a program is to multiply the number of homes to be upgraded (490,000-650,000) by a projected cost per household. The U.S. Weatherization Assistance Program has spent an average of $4,000 per home, which includes both energy efficiency and health and safety inspections and strategies (it is a program for lower income people). If $3,000 were the average cost per Alberta home for the weatherization (most homes wouldn't need the health and safety work), this would mean a program cost of $1.47 billion to $1.95 billion. This is fairly consistent with the $912 million to $1.94 billion calculated above.

GHG emission savings

Alberta households built prior to 1984 emit 3,900 kilotonnes of CO2e.[217] The US Weatherization Assistance Program achieves 33.5% savings on natural gas used for space heating.[218] Assuming that percentage savings in Alberta could be at least that high (Alberta is colder), and that we are upgrading 490,000 to 650,000 homes, this would result in a reduction of 711 to 943 kilotonnes – the equivalent of taking 150,000 to 200,000 cars off the road, and keeping them off, year after year.

Federal ecoENERGY program

The federal Parliament has recently approved increased funding of the ecoENERGY Retrofit-Homes program, adding $300 million to the program. The government website says this will allow as many as 200,000 more homes across Canada to participate in the program.[219]

The ecoENERGY program provides very limited grants for upgrades, requiring significant homeowner investment to leverage the federal money, likely resulting in limited uptake of the program. Many of the homeowners accessing the plan will be those who would have done the upgrades anyway.

If the new ecoENERGY money were distributed among provinces and territories on a per-capita basis, it would allow about 20,000 Alberta homes to qualify for support. This would be 3 per cent-4 per cent of the Alberta homes that would receive support in the program outlined above – a drop in the bucket.

Appendix 2

Eliminating fossil fuel handouts creates green jobs

A key step in developing a greener economy is to remove the subsidies that are taking us in the wrong direction. Such subsidies are often called perverse subsidies, or environmentally harmful subsidies. Removing them will level the playing field and thereby encourage greener investments. It also will free up public funds for investing in green job creation.

There is plenty of opportunity for removing environmentally harmful subsidies.[220] This appendix will briefly discuss two of the major ones – subsidies to the fossil energy sector and subsidies to automobile use and trucking.

Fossil energy sector subsidies

Eliminating subsidies to the fossil energy sector will spur renewable energy investment, and its creation of green jobs. It would also make other sectors more competitive for investment capital, thus helping to diversify Alberta's economy and reduce its reliance on volatile global energy markets.

Federal government subsidies for oil and gas development have been very substantial. Between 1996 and 2002, they amounted to over $8 billion.[221] Alberta's provincial government fails to provide data on its subsidies to the industry, however, at least some portion of the provincial subsidies are known. As noted in the main text, since its highly publicized royalty rate increase announcement (aimed at increasing revenues by $1.4 billion per year), the Alberta government has quietly committed $4.5 billion in subsidies to the oil and gas extraction industry,[222] on top of $2 billion of unbudgeted spending on carbon capture and storage (CCS) announced in July 2008.[223]

Moreover, governments are failing to collect the full rents available from resource extraction. The people of Alberta own Alberta's fossil fuel resources, and the provincial government sells them on our behalf to energy corporations, capturing a portion of the windfall profits (rents) available through royalties, taxes and other means. However, Alberta's government fails to charge globally competitive prices for these resources, instead providing steep discounts. This amounts to an additional subsidy to the industry, and when energy prices are up this subsidy can reach into several billions of dollars per year.[224]

Removing these subsidies to the oil and gas sector – direct financial grants, tax measures, and uncaptured rents – could free up billions of dollars per year. In addition, it would reduce the unfair financial advantage that fossil fuel extraction enjoys over the renewable energy sector, thereby boosting investment in renewable energy job creation.

Also it would accord with the preferences of Albertans. As noted in the main text of this report, 78 per cent of Albertans prefer subsides for renewable and clean energy options rather than for oil and gas development.[225]

Automobile and trucking subsidies

Eliminating automobile and trucking subsidies can help to create green jobs in Alberta.

Alberta's capital plan[226] contains major subsidies to automobile usage and freight trucking, two of the areas where Canada's greenhouse gas emissions have risen most quickly over the last decade. As noted earlier, out of a $22 billion capital spending plan for 2008-2011, the largest single allocation is to highways, at over $5 billion. Further significant road spending will come from the municipal allocation of nearly $5 billion.

In contrast, under this capital plan the provincial government will not directly spend anything on transit. While $2 billion had been allocated to transit in 2008, by 2009 it appeared to have been cut.[227]

Under the current capital plan, any significant transit investment will be made by local governments, and taken from whatever they manage to carve out of their grants and other budgetary sources.[228] Competing priorities for municipal transfers will include roads, bridges, emergency services, water and wastewater, and infrastructure management systems. Given the enormous and wide-ranging infrastructure deficit faced by local

governments, there are significant constraints to what they are able to invest in transit.

Alberta already has the most sprawling cities and automobile dependency in Canada, and increasing road capacity tends to induce extra road use and emissions.[229] Phasing out road subsidies can be accomplished by shifting costs off of taxpayers and onto motorists. This would free up further billions of dollars per year in public money and reduce emissions.

Reducing the subsidies to motorized road use, especially in conjunction with similar policies in other jurisdictions, would mean that local food production will accelerate, as local foods once again become competitive with foods imported from thousands of kilometres away. The result will be the shoring up and expansion of the existing agricultural base and the development of new local food industries. Development of greenhouses and other mechanisms to extend the growing season and diversify local food production can employ many of the rural Albertans who have lost their farming jobs in recent years.

Local manufacturing would also be boosted by reducing road subsidies. The local manufacturing sector would become more competitive as import prices begin to incorporate their full costs of transportation. This would lead to expansion and diversification of the manufacturing base, as markets for domestic products firm up and effectively expand.

Other perverse subsidies

Subsidies to the oil and gas sector and to automobile and trucking are just two examples of environmentally harmful subsidies, albeit two of the more important ones. In addition to eliminating these two sets of subsidies, a comprehensive provincial review of subsidies should be undertaken, with a view to identifying and eliminating those that are environmentally harmful.

Doing so would reduce our environmental footprint. At the same time it would free up public money and level the playing field so as to encourage long-term private investments for green economy and green jobs investments.

Appendix 3

Reducing greenhouse gas emissions

This appendix explains the main mechanisms for reducing greenhouse gas (GHG) emissions, and some of the characteristics of those mechanisms.

There are three main categories of policy instruments that can be effective at reducing GHG emissions: regulation, cap-and-trade, or carbon taxation. In the lead-up to the 2008 federal election, each of these was advocated by one of the three main national political parties.

Strategies for reducing greenhouse gas emissions

The only way to control global warming is to reduce emissions of greenhouse gases (GHGs). Carbon dioxide is the most important of these gases, and it comes primarily from burning fossil fuels.

One GHG reduction strategy is ***regulation***. Regulation sets a fixed level of emissions for a polluter, or requires the use of certain processes or technologies. Once compliance with the regulatory standard is achieved, there is no incentive to make further improvements (this is the "threshold effect"). The costs of regulation are paid by polluters, who then pass those costs on to consumers as much as possible. This non-market "command-and-control" approach was the strategy advocated by the Conservative Party prior to the 2008 federal election.

Another strategy is ***cap-and-trade***. The idea here is that a cap on the level of overall emissions is set – whether for a sector or for the economy as a whole. Permits for emissions up to that level are auctioned by the government, creating a revenue stream available for investments. The permits can then be bought and sold on the open market, meaning there is no limit on how much a polluter can emit, and allowing for emission reductions to be made by whichever polluters can make the reductions most cheaply. This avoids the threshold effect, creating a "dynamic" incentive to continually reduce emissions. This market-based approach was the strategy advocated by the NDP in the 2008 federal election.

Another strategy is the ***carbon tax***. The idea here is that when you tax carbon emissions, you provide an incentive to reduce those emissions, while creating a

revenue stream available for investment. Like cap-and-trade, there is no fixed limit on how much a polluter can emit, and the incentive is dynamic, encouraging continual reduction and avoiding the threshold effect. This approach was the strategy advocated by the Liberal Party in the 2008 federal election.

All three of these mechanisms impose costs of compliance, and for all of them part of the costs will be passed on to the consumer. Thus, all of these mechanisms can be considered to be a form of carbon pricing. Economists note that carbon taxes and cap-and-invest are more efficient in that they can achieve greater reductions in emissions per dollar spent on compliance. Put differently, regulation makes achieving the same goals more expensive for polluters.

Any of these systems can be combined with another. For instance, the government of Alberta currently has a regulation-tax hybrid.[230] Industrial emitters are required to comply with certain carbon emissions intensity standards. If they fail to do so, they have to pay a fee ($15 per excess tonne of carbon emitted).

It is clear that the strategy of voluntary restraint of polluting emissions does not work. An exhaustive study by the OECD concluded that voluntary measures are ineffective at achieving environmental goals, as well as being economically inefficient.[231] This finding stands to reason: voluntary restraint is what we have right now (anyone can voluntarily reduce their GHG emissions), and it hasn't worked.

Likewise, so-called "intensity-based" GHG targets – GHG emissions per dollar of economic activity – are of little use, as they actually allow for increases in GHG emissions. In the atmosphere it doesn't matter whether GHG levels per dollar of economic activity come down, it only matters whether real GHG levels come down.

If boosting employment is our aim, then the choice among the three effective policy options should be guided by their respective capacities to create green jobs. All three will create green jobs by reducing the unfair subsidy enjoyed by fossil fuels have (i.e. the presence of free carbon waste disposal in the atmosphere) and enabling other, more job-rich sectors to compete on a level playing field. However, there is one key factor that does distinguish the options: some raise revenues that can be invested in creating green jobs. Thus, either cap-and-trade with auctioning of permits or carbon taxation should be adopted if our goal is to create green jobs.

The green jobs policies proposed in the main body of this paper do anticipate the need for several billions of dollars in temporary public investment. This temporary cost can easily be paid back by revenues from cap-and-trade or carbon taxation. The costs of inaction are far higher, and permanent: Paul Volcker, former chairman of the U.S. Federal Reserve, said, "If you don't [reduce global warming], you can be sure that the economy will go down the drain in the next 30 years."[232]

Finally, it now seems clear that if Alberta and Canada don't act quickly our GHG policies are going to be determined by policies south of the border. Indeed, after Barack Obama won the U.S. election, one of the Canadian federal government's first acts was to state that it wished to negotiate with the U.S. on a continental global warming plan. However, the U.S. government, by its actions, has made it clear that it plans to proceed on its own. This may be because the U.S. administration and Congress recognize that Canada's federal government, under both ruling parties over the last 20 years, has steadfastly resisted taking any serious action on global warming.

The U.S. federal budget now anticipates revenues from cap-and-trade auctions by 2012. The administration, House and Senate have all signalled their intention to introduce GHG laws in 2009. A bill recently introduced in the House of Representatives contains a low carbon fuel standard that might make tar sands oil far less competitive to U.S. refineries.[233]

With the large majority of our oil and gas production being exported to the U.S., the stakes are obviously high. Canada and Alberta will need to act quickly to demonstrate that they are serious about GHG emission reductions. If Alberta doesn't get serious about reducing GHG emissions – especially from the tar sands – then we run a very real risk of have our major export shut out of, or seriously handicapped, in our major market. In this way, embracing strategies for GHG emission reduction is not just an environmental imperative – it's an economic imperative.

Alberta could easily extend its regulation-tax hybrid system to cover a broader section of the economy, set a schedule of carbon-price increases, and apply it to real GHG emission reductions, rather than "intensity-based" reductions.

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228 The only apparently dedicated transit funding appears to be flow-through federal funding of $53 million – about one per cent of the highway allocation, let alone municipal road allocations. This is to be shared among 11 communities for capital infrastructure projects – an average of less than $5 million per community. Capital infrastructure projects tend to be quite expensive by comparison. For example, one temporary park-and-ride parking lot in the City of Edmonton is expected to cost $13 million.

229 T. Litman, "Generated Traffic and Induced Travel: Implications for Transport Planning" (Victoria Transport Policy Institute, February 3, 2009) http://www.vtpi.org/gentraf.pdf.

230 "Go figure -- a carbon tax crafted right here at home" (Calgary Herald, March 09, 2007) http://www.canada.com/calgaryherald/columnists/story.html?id=8c3c9760-7cbe-4fab-b00c-1c77243903b6 (accessed March 12, 2008).

231 Organization for Economic Cooperation and Development, "Voluntary Approaches for Environmental Policy" (OECD, 2003) http://www.oecd.org/document/53/0,3343,en_2649_34281_35154357_1_1_1_1,00.html accessed November 10, 2008.

232 AFX, "Volcker: Global warming bad for economy" (ABC Money, February 6, 2007) http://www.abcmoney.co.uk/news/06200718912.htm.

233 S. Alberts, "U.S. climate change bill could side-swipe oilsands" (Calgary Herald, March 31, 2009) http://www.calgaryherald.com/business/climate+change+bill+could+side+swipe+oilsands/1449115/story.html.