



COMMENTARY

Jobs and the Low-Carbon Energy Transition: Perspectives from Cumberland County

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January 2017

The Pan-Canadian climate plan is out—and it is a landmark achievement. Not surprisingly, a key debate now revolves around its implementation and the impact that climate pricing, coupled with regulations and standards, will have on competitiveness.

This is not unexpected, since competitiveness has always been at the heart of the green agenda. For 40 years, industries and governments have worried that tougher pollution standards push up costs, flatten margins in tight markets and shed jobs as companies lose markets from cheaper imports originating from jurisdictions with weaker standards, or companies themselves pick up and move to those less-stringent jurisdictions—the so-called “pollution haven” effect.

Looking back at the economic literature—including groundbreaking analysis by IISD Senior Fellow Robert Repetto (1995)—the evidence shows that stricter environmental standards have not led to eroding competitiveness, job losses, trade diversion or the relocation of factories to jurisdictions with weaker environmental regulations. Today, economists working on carbon pricing in Canada focus much of their efforts on identifying those households and sectors most vulnerable to carbon pricing, as well as deadweight losses associated with fiscal or other measures.¹

In some ways, the current debate about competitiveness, climate and jobs rehearses those anxieties of decades ago. Yet, they take place today in a far more stark setting. Pervasive insecurity about jobs and wages has become *the* lightning rod of discontent within many western democracies—and not without reason. The entry of China and other countries into the World Trade Organization created a systemic shock that few anticipated.²

At the same time that job losses have occurred in Organisation for Economic Co-operation and Development (OECD) countries due to wage and other variables within global supply chains, income inequality has increased during the same period. Economist Thomas Piketty (2014) assembled data from 20 countries that shows deepening inequality within and between countries. These two factors have unleashed electoral rage in many western countries.

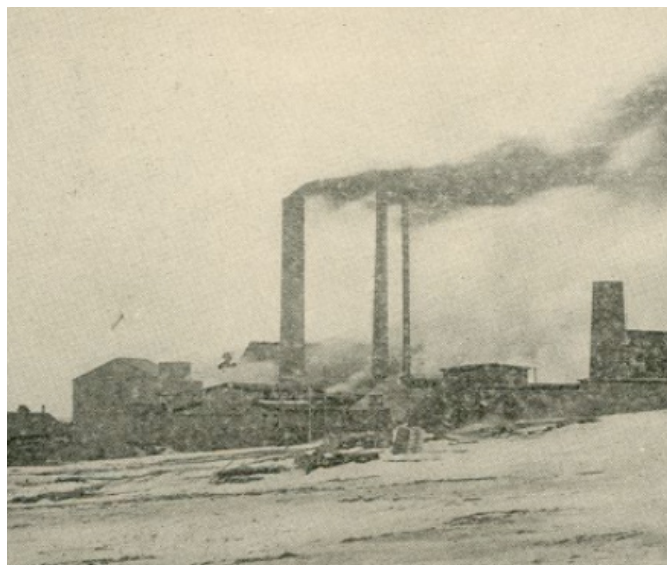
In Canada, a [report](#) released by IISD in November 2016 found that the lifetime job earnings of an average Canadian worker today are the same as they were in 1980. Despite the investments households have made in higher education, job training and new skills development, Canada’s human capital has stagnated in the past 30 years.

¹ See for example the excellent work of Canada’s Eco-Fiscal Commission, including that of Beugin et al. (2016).

² See for example, International Monetary Fund (2016)



Miner with lunch can and lantern
Source: Government of Nova Scotia Archives



Cumberland Railway and Coal Co. — No. 1 Slope, Springhill, NS
Source: Government of Nova Scotia Archives

Our report is a rigorous, statically intensive mirror of what is called Canada’s comprehensive wealth. Based on this broad-based measurement, we found that Canada’s wealth has grown by less than 0.2 per cent per year since 1980.

Against this wider backdrop, more work is urgently needed to answer a simple question that, if left unanswered, may undermine the aspirations of the 2015 Paris Agreement—Does ambitious climate action create, shed or have no impact on jobs?

A Shift in Cumberland County

Before looking at some job statistics, it’s key to remember that anxiety about jobs isn’t an abstraction. Jobs are the key to communities and the families that shape them. The shadow of past labour shapes the values and traditions that form our communities today. Flying over these either by looking at aggregate numbers or literally to land in global cities misses the remarkable stories that bind past with present.

One such story is in remote Cumberland County in Northwestern Nova Scotia, Canada.

Cumberland County is starkly beautiful, sparsely populated and economically depressed. Its per capita GDP is a quarter below the national average. It is populated with small farms, coastal fishing villages and a few mid-sized towns.

One of those towns is Springhill. Like other towns, much of the wealth of Nova Scotia—from its homes, infrastructure and collective memory—comes from natural resources, including mining. Since it was first recorded in 1673, there has been near-continuous mining throughout Nova Scotia. Like other towns in the province, mining in Cumberland County began at scale in the mid-19th century and boomed for more than a century (Nova Scotia Archives, n.d.).

The town of Springhill was the centre of that boom in Cumberland County. While Springhill is dwarfed by much larger coal mining communities—notably in Cape Breton—it nevertheless produced more than 35 million tonnes of coal between 1863 and 1976. Springhill coal helped fuel the booming railways across Canada that were, until the 1950s, operated using coal-fired steam engines. Those trains in turn hauled Springhill coal to ports like Halifax and Montreal, where it was shipped to England, Wales, the United States and the Caribbean.

During Springhill’s coal century, more than 4,000 coal miners worked its mines. These were good jobs—wages were higher than farming or fishing, and workers were provided with benefits like company housing. They were also immensely hard jobs: boys began in the mines at eight or nine years old, shifts were long, conditions were harsh and



The River, Parrsboro, Nova Scotia

Source: Government of Nova Scotia Archives



Tidal current at Cape Split cliffs, Cumberland County, Nova Scotia

Source: Rixipix (iStock)

the risks were deadly. The Springhill coal mines are synonymous with tragedy: On February 21, 1891, an explosion killed 125 miners. On November 1, 1965, 39 miners died from another explosion. Less than two years later, 75 miners died in an underground earthquake.

The Nova Scotia archives record the names of more than 450 miners killed in Springhill; almost half died in single accidents over the years. Many others died after retiring from damaged lungs resulting from breathing coal dust for years.

Today, the coal mines of Springhill are quiet. The flooded mine shaft is one of the deepest in the world, and thermal waters heat one of the town's districts. A small museum is open in the summer, with jittery tourists descending 40 feet below the surface, to glimpse the darkened shafts that stretch 13 kilometers dead ahead. Other museums should honour the skill and bravery of the miners who worked in similar mines.³

In the years ahead, other coal mines around the world will inevitably follow the path of Springhill. Germany has promised to be a net carbon-zero country by 2050, ending its reliance on coal in favour of renewable energy. In October 2016, China put a cap on coal-fired electricity production, and set a target of allowable carbon per gram of electricity generated from coal-fired plants. In the United States, a coal mining labour force that once numbered close to 250,000 is now at less than 50,000.

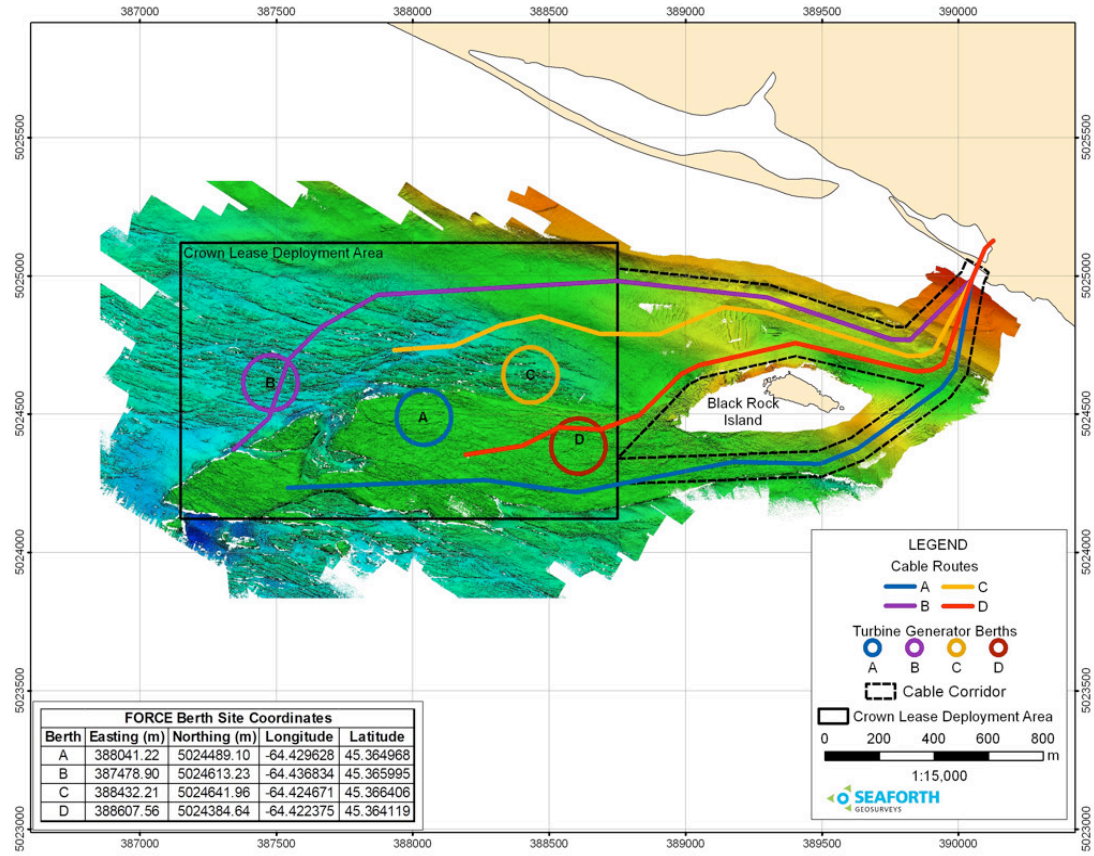
New Power From Below the Surface

If you follow the abandoned rail line that ran from Springhill to the Bay of Fundy, you arrive at another small town—Parrsboro, in Cumberland County, where a new energy economy is taking shape, again harvesting energy from below the surface.

On November 22, 2016, the first electric power was generated from the [tidal energy project](#) in the Bay of Fundy. Located a few kilometers away from the collapsed docks that loaded coal to Boston and other ports, the new five-story turbine power plant is generating enough power to serve 500 homes.

In 2017, a second and much larger turbine will be deployed, making this site among the largest flow generating projects in the world. The current plan is to deploy a total of five turbines in this region. The Bay of Fundy site moves 160 billion tonnes of water four times a day through its narrows, and its developers estimate its renewable power potential to be 7,000 megawatts.

³ Nyquist (2016) estimates that between now and 2050 natural gas use will grow quickly, while demand for coal will peak around 2025. Demand for oil for transport, will decrease, as vehicles become more efficient, infrastructure spending supports public transport, and advances in electric vehicles and bio-energy fuel sources increase. By 2050, the research estimates that coal will be down to just 16 per cent of global power generation (from 41 per cent now) and fossil fuels to 38 per cent (from 66 per cent now). Overall, though, coal, oil, and gas will continue to be 74 per cent of primary energy demand, down from 82 per cent.

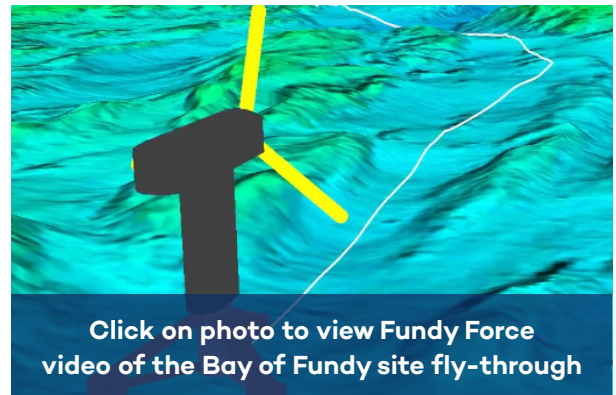


The Bay of Fundy Berth Site Deployment Area Source: Fundy Force

There are concerns about the longer-term, cumulative effects of these generating stations. Robust and transparent monitoring will be critical, including assessments regarding impacts on fish stocks, silting and marine life such as seals and whales.

One of the questions surrounding this new site is jobs. The Nova Scotia government hopes that thousands of new skilled jobs will result from this tidal power site. The developers boast that as many as 22,000 direct and indirect jobs will be created.

While 22,000 seems inflated, time will tell. Over the past four years I've seen new jobs in Cumberland County materialize, from crews working the boats and barges, to engineers and others redesigning, installing and monitoring the turbines, buildings and transmission lines that have been built to support this new power source.



Coal to Renewables—And What That Means For Jobs

Is the creation of new jobs linked to renewable energy underway in Cumberland County being repeated elsewhere? Are old jobs being replaced by new, low-carbon ones?

In 2016, the International Renewable Energy Agency (IRENA) estimated that more than eight million jobs have been created in the renewable energy sector alone (IRENA, 2016). Those include engineering and software design jobs, manufacturing jobs in solar, wind, geothermal and other systems, jobs in installation, servicing, repair and marketing



(IRENA, 2016). This trend is projected to increase. For example, the cost of solar power is cheaper than the cost of coal in some countries. Solar panels have dropped in price by more than 70 per cent in the last five–six years, and new ways of deploying solar services is evolving rapidly.

In the United States, the U.S. Bureau of Labour Statistics (BLS/2012-2013) estimates that there are 3.1 million jobs associated with producing green goods and services. These outputs represent roughly 2.4 per cent of total employment. Another Bureau survey estimates that an additional 855,000 jobs, representing about 0.7 per cent of total U.S. employment, is involved in environmental activities, including complying with federal, state and municipal regulations.⁴

In the energy sector, the U.S. Department of Energy (DOE) estimated that 3.6 million Americans work in traditional energy industries, including production, transmission, distribution and storage. Of this total, 600,000 employees contribute to the production of low-carbon electricity, including renewable energy, nuclear energy and low emission natural gas.

One of the biggest areas of multi-year job growth is in U.S. renewable energy: 2015 marked the third consecutive year in which jobs from solar energy grew by 20 per cent per year. In the past five years, according to the DOE report, jobs in solar energy have grown by over 120 per cent, to 115,000 jobs, with another 77,000 in the wind energy sector. In addition, almost two million Americans work to some extent in energy efficiency, while an additional 30 per cent of the almost seven million U.S. construction jobs were devoted to energy efficiency (US Department of Energy, 2016; Nadel, 2017).

In Mexico, based on a major assessment by the International Labour Organization (ILO) and the federal government (ILO, 2013), an estimated 1.8 million jobs were directly related to the environment, representing 4.5 per cent of the total Mexican formal and informal labour force. Major sectors included agriculture, forestry, energy, water and wastewater treatment and tourism.

The report argued that the multiplier effects of green jobs was significant: for example, each million pesos spent in traditional farming generated 16 jobs, while the same investment in organic and sustainable farming generated 45 jobs (ILO, 2013).⁵

In contrast to the United States, Mexico (and other countries), Canada doesn't yet systematically track categories of green jobs, or aggregate shifts from fossil fuel to renewable energy, energy efficiency and other low-carbon jobs.

Statistics Canada does track total expenditures on environmental goods and services including hardware and software used in renewable energy installing like the Bay of Fundy facility. Total revenue derived by Canadian businesses from sales of environmental goods and services totalled \$3.9 billion in 2010 (Statistics Canada, 2013). Of this, \$2.2 billion was derived from environmental goods manufactured in Canada, and environmental services accounted for \$1.7 billion. Roughly, 41 per cent of total revenue from environmental goods was derived from machinery, equipment and products for renewable energy production. Services were led by environmental consulting, at \$1.0 billion or 58 per cent. Site remediation and emergency environmental services generated the remaining \$715 million in revenue. Canadian businesses exported \$712 million worth of environmental goods and services in 2010, with the majority (82 per cent) going to the United States.

These statistics shed light on the direction of new, green jobs. Yet more work is needed to compare the relationship between low and high-carbon jobs, at the aggregate level, at the country level as well as in relation to wages and multi-year job security.

⁴ In the U.S., private industry accounted for 2,268,800 of this total of green jobs. Manufacturing had the largest share—20 percent—and manufacturing 4 per cent. The construction industry (including construction of plants that produce energy from renewable sources and weatherizing and retrofitting projects that reduce household's energy use) created 372,100 jobs. The construction industry comprises engineering and architectural services, computer systems design and management and consulting services. Local government was responsible for the major part of GGS jobs in public sector with 476,500.

⁵ Note that the two employment estimates cannot be added due to different methodologies.



This is part of a bigger question related to competitiveness: Do more stringent climate policies hurt economic growth? It depends on the design and characteristics of the policy—public policy details related to climate action are important.

A final lens of this question is trade. The world will soon see what the new U.S. administration does on both trade and climate, given concerns—mentioned at the outset—that climate action will divert trade to countries with weak targets and policies.

So what does the evidence say? A report by the OECD (2016) concluded that countries that implement stringent environmental policies do not lose export competitiveness when compared with countries with weaker environmental regulations. This study looked both at standards of richer countries like Canada, as well as large middle-income and export-intensive countries like China.

The OECD concludes that Canadian competitiveness—including in energy-intensive and trade-exposed sectors like steel and cement—would not be affected by tougher standards, nor would China attract investment and trade advantages through weaker climate or environmental standards (OECD, 2016).

The OECD report adds to decades of analysis, modelling and evidence that show similar results. Yet more evidence and analysis, as well as the means to communicate it to families, are still needed to understand how the transition to low-carbon energy systems affects jobs, wages and families.



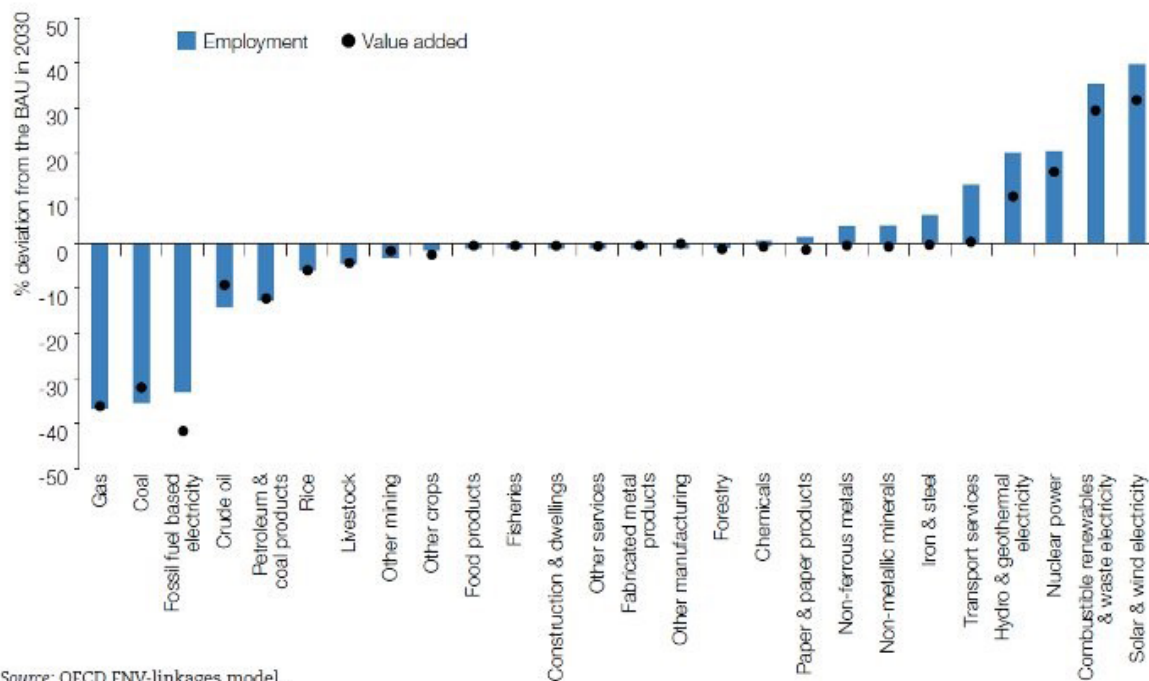
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Appendix: OECD Economic Model Results

Economic modelling suggests that ambitious climate-change mitigation policies could be good for both jobs and the environment. A study using the OECD's ENV-Linkages model shows that a well-designed emissions trading system could sharply reduce GHG emissions while allowing GDP to keep growing (although at a slightly lower rate). The key is mobility, with workers able to move easily from sectors where employment would drop, notably fossil fuel industries, to sectors such as renewable energy industries where job opportunities rise rapidly. Countries exporting fossil-based energies would be most affected.



Source: OECD ENV-linkages model.

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