



Re: RFI: Regulations and Grid Modernization

Moltex background

Moltex is a company developing two complementary technologies to both address nuclear waste and produce carbon-free energy. Combined, they can significantly reduce the volume of high-level radioactive waste in Canada while producing at least 6 GW of carbon-free power for 60 years, with no new mining, complete fuel supply security, and at a lower cost than any other long-term solution currently envisioned for spent nuclear fuel.

- Waste To Stable Salt (WATSS) is an affordable, small-footprint facility for recycling spent fuel bundles from Canada's existing CANDU reactors, producing safer end products and fuel for a molten salt small modular reactor (SMR).
- The Stable Salt Reactor – Wasteburner (SSR-W) is an inherently safe SMR that uses the fuel produced by WATSS to generate up to 500 MW of carbon-free electricity per unit.

An additional technology, called GridReserve, completes a full Moltex power plant. GridReserve is not a new innovation by Moltex; instead, it is a commercially proven system for thermal energy storage transferred from the concentrated solar power industry for use in conjunction with the SSR-W.

The addition of GridReserve to a Moltex power plant enables the plant to provide “peaking” power that is responsive to the dynamics of the modern electrical grid, which includes both variable load and variable generation from renewable sources (wind and solar). Thanks to GridReserve, a Moltex power plant provides dispatchable capacity to the grid (megawatts of power on demand), which complements the intermittent energy from renewable sources.

Moltex is a unique, Canadian nuclear technology leader with world-changing potential

Canada, through Moltex, holds the promise of resolving one of the main challenges in the nuclear sector by recycling spent fuel from other reactors, greatly reducing high-level nuclear waste.

Canada is committed to decarbonizing, and experts agree, “there is no net zero without nuclear.” In this pivotal moment, Canada has an opportunity to not only decarbonize domestic energy, but also capture huge economic growth as a recognized, global, top-tier nuclear provider. However, this moment can be lost if Canada hesitates on decisive action at the federal level.

To secure a world-leading position in nuclear technology and a national legacy of being the first to bring to market a cost-effective solution for recycling used nuclear fuel, Canada must make swift, bold moves. Further, Canada's nuclear leadership is necessary for cost-effective grid modernization, particularly with respect to fuel supply security.

Moltex recommendations for effective government programs and regulations for grid modernization

1) *Operating within Canada's current energy regulatory constructs, how might the pace of electrification and grid modernization be accelerated?*

a) *What specific tools, services, guidance and/or resources are required? Do these apply to particular jurisdictions, or can they be applied more broadly?*

As seen in the EU, UK, and USA, nuclear energy must be listed as a zero-carbon source of energy and therefore included in "green" taxonomies so it is eligible for the same incentives available to renewable energy technologies. Further, new energy system developments that include support for workforce transitioning and replace existing fossil fuel generation should be eligible for a higher bracket of incentives.

b) *Is there a role for the federal government to support through programming, and what are the specific needs?*

The government could help in raising public awareness of the necessary role nuclear must play in a decarbonized energy sector, and in shedding light on common misconceptions about the relative risks of different energy options.

2) *In consideration of the previous question, if the regulatory constructs require change, what is needed to enable that change?*

a) *What specific tools, services, and/or resources are required to facilitate this change? Do these pertain to particular jurisdictions, or can they be applied more broadly?*

Grid operators need to be consulted as to the optimal resource mix of a decarbonized grid, and market rule changes may be required to align private investor interests with societal interests. For example, developers (investors) generally prefer straightforward, short construction-cycle projects. Renewable technologies such as solar panels are simple to install and projects can be completed relatively quickly, making such projects attractive to private investors. However, renewable generation assets alone do not support a stable grid. Baseload and load following generation assets, such as nuclear, have longer construction times, are more complex, and so are more difficult to finance. Yet, they are necessary to achieve the optimal blend of resources to support a stable, secure grid at minimal costs to ratepayers. For these reasons, the societally optimal amount of nuclear generation may be under-supplied by the market.

Therefore, the role of government in setting appropriate market rules or applying incentives must be guided by grid operators, who can help determine whether, of what types, and in what amounts public support is needed for specific grid technologies.

b) *What can the federal government do to facilitate this change? Is there a role for the federal government to support through programming?*

In addition to leading industry working groups and convening experts to advise on new market rules, important federal support for advanced nuclear technologies falls into four areas:

- I. Financing to de-risk technology development.
 - 50% of cost share for the development of new, zero-carbon Canadian technologies such as SMRs.
 - CIB loans to cover 50% of project costs (pre-construction and construction) to reduce electricity costs for first-of-a-kind advanced energy technology projects.
 - A government backstop on project cost overruns for the first unit to enable private investment.
 - II. Streamlining the regulatory process.
 - The current Impact Assessment (IA) process is not compatible with decarbonisation timelines. For the entire nuclear sector, the IA should be restructured to take no more than three years.
 - III. Ensuring fuel security and a waste policy. (Moltex, unlike other reactors, does not use fresh uranium).
 - Additional waste costs for first units should be borne by the federal government until a fleet is deployed and costs can be spread over multiple units.
 - A policy to specifically enable spent fuel recycling should be in place.
 - IV. Offering incentives to match or surpass international competitors to counteract “brain drain.”
 - A one-to-one copy of the USA’s Inflation Reduction Act would be a great starting point; however, to command a leadership role, Canada must be more aggressive. Include nuclear in green bond taxonomies; provide ‘payment in lieu’ alternatives to the Investment Tax Credits (ITCs); extend the ITC eligibility period for nuclear to at least 2040; add a production tax credit (PTC) option; provide loan guarantees, low interest loans, and grants; and make nuclear eligible for the Accelerated Capital Cost Allowance, an extended Accelerated Investment Incentive, and The Clean Fuel Manufacturing Tax Credit. These points have been raised by the CNA.
- 3) *How could federal funding stimulate those changes? In general, what are the regulatory, market, policy barriers and opportunities for innovations in electric grid modernization, distributed energy resources, and behind-the-meter resources? Do you have examples of barriers and opportunities faced in your jurisdiction?*
- Foreign SMR companies vying for the Canadian market have already received billions of dollars in federal funding – much more than Canadian-developed SMRs – tipping the playing field to Canada’s disadvantage.
 - SMR companies in Canada today are offering technologies that rely on foreign sources of fuel (or uranium enrichment, which Canada has no plans of doing domestically). If

developing a home-grown nuclear sector that is free from reliance on foreign fuel is of national importance, then it should be a national priority to close the cost gap for first-of-a-kind technologies that do not require fuel from outside Canada.

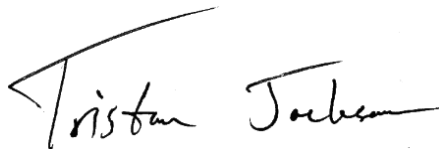
- Public funding can level the playing field with other nations, particularly the US, and can establish Canada as a technology leader with export potential and secure domestic fuel supply.
- 4) *To what extent might the existing regulatory, markets, and policy environment result in potential disproportionate impacts to specific customer segments from electrification and grid modernization? What regulatory, market, and policy innovations could be implemented to mitigate these impacts?*

Other jurisdictions around the world, most notably Spain, Germany, New York and California, have shown that incentives for renewable energy can lead to over-deployment of intermittent generation resources, grid instability, rising costs, and even rising CO2 emissions. This experience has shown that intermittent sources must be matched well with firm, zero-carbon baseload generation such as large hydro or nuclear power, or fossil-powered sources will end up providing the necessary backup power.

These negative externalities disproportionately impact lower-income populations as they tend to pay a higher percentage of their income in energy costs and tend to live in areas more directly affected by pollution or served by weaker grid infrastructure.

Markets must be corrected to make nuclear projects economically competitive with other zero-carbon energy sources. There are several possible mechanisms for doing this, including investment and production tax credits, capacity (as opposed to energy) incentives, and linking public funding to long-term, well-paid employment. Most importantly, the optimal incentive structures and market rules should be developed with extensive input from grid operators.

Sincerely yours,



Tristan Jackson

Vice President, Corporate Development, Moltex