Innovation, Science and Economic Development Canada
235 Queen St.
2nd Floor, West Tower
OTTAWA ON K1A 0H5

Innovation, Sciences et Développement économique Canada

PROTECTED

Your File **Votre référence**

AOMT

Our File **Notre référence**
A-2024-00087 / JD
A-2024-00848 / JD

March 31, 2025

Dear Applicant,

This is further to your request submitted under the *Access to Information Act* (the *Act*) for: "**Please provide all communications, including attachments, received by the Minister, Deputy Minister, Assistant Deputy Minister, Director Generals or Directors with respect to the "recycling" or "reprocessing" or re-use of nuclear fuel waste (irradiated nuclear fuel, used fuel, spent fuel, CANDU fuel) for any purpose received between January 1, 2023, and April 19, 2024. Please include communications within the department and those received from other federal departments, Crown agencies, regulatory bodies and contracted entities, and any private sector entity or agent including but not limited to the Canadian Nuclear Society, Canadian Nuclear Association, CANDU Owners Group or others, and any non-governmental organization or educational institution or individual**."

We are pleased to provide you with a final disclosure of information. Enclosed is a copy of a portion of the information relevant to your request. Further to our assessment, it was determined that some of the information is withheld pursuant to sections 14, 15, 18,19, 20 and 21, of the *Act* (see link for details http://laws-lois.justice.gc.ca/eng/acts/A-1/). This completes the processing of your request.

For your information, you are entitled to file a complaint with the Information Commissioner within sixty days from the receipt of this notice. Notices of complaint may be sent to the Office of the Information Commissioner, 30 Victoria St., Gatineau QC K1A 1H3.

Canada

Should you have any questions, please contact Joanne Davidson at 343-552-8432 or by email at joanne.davidson@ised-isde.gc.ca.

Sincerely,

Croteau, Annie

Digitally signed by Croteau, Annie
Date: 2025.03.31 13:33:37 -04'00'

Anik Meredith
A/Director, ATIP Services

Enclosures: 2 Pages
Excel Document

c.c.: Gordon Marshall, Investigator, OIC

White-Senack, Elizabeth (ISED/ISDE)

From: Ravary, Liz <liz.ravary@nrcan-rncan.gc.ca> on behalf of Beauregard-Tellier, Frédéric <frederic.beauregardtellier@nrcan-rncan.gc.ca>
Sent: December 18, 2023 3:58 PM
To: Tanya.Hinton@international.gc.ca; naina.thoppil@international.gc.ca; alison.grant@international.gc.ca; duck.kim@ec.gc.ca; mary.taylor@ec.gc.ca; White-Senack, Elizabeth (ISED/ISDE); O'Keefe, Paul (ISED/ISDE); julia.cropley@cnsc-ccsn.gc.ca; genevieve.boudrias@cnsc-ccsn.gc.ca; lee.brunarski@cnsc-ccsn.gc.ca; debora.quayle@hc-sc.gc.ca; marc.desrosiers@hc-sc.gc.ca; Daniel.Daigle@tc.gc.ca; david.lamarche@tc.gc.ca
Cc: Prosser, Kathleen; Yuen, Pui Wai; Fairchild, Jamie; Wilkinson, David; Wittmann, Tess (she, her | elle, elle); Rector, Brianna (she, her | elle, la); Poupore, Jessica; Beauregard-Tellier, Frédéric
Subject: Used fuel reprocessing working group / Groupe de travail sur le retraitement des combustibles usés
Attachments: NRCanBrief_UsedFuelReprocessing_Nov2023.docx

PROTECTED B - PROTÉGÉ B

Dear colleagues,

I am writing to invite representatives from your department to participate in a working level working group on the subject of used fuel reprocessing.

Canada does not have a policy or a formal internal analysis on commercial reprocessing, including used fuel processing. While nuclear energy and technology, and nuclear non-proliferation, are key to this area, this is a subject that crosses the mandates of many departments. The efforts of this working group, lead by NRCan, will generate a thorough and well documented internal analysis on used fuel reprocessing to support future decisions related to Canada's nuclear fuel cycle.

This work does not constitute the development of a policy for used fuel reprocessing but is rather a consolidation of the federal government's efforts to understand the risks and benefits associated with the technology. A description of the planned analysis, and the rationale for this undertaking, can be found in the attached Brief.

If you could please have members of your team who are interested and able to participate complete the below poll, we would be grateful to launch this work before the holiday season.

https://doodle.com/meeting/participate/id/avYOMAge

Thank you for your support and expertise on the matter as we develop a better understanding of the risks and benefits of used fuel reprocessing from all perspectives within the Government of Canada.

Kind regards,

Frédéric Beauregard-Tellier
Director General, Nuclear Energy and Infrastructure Security Branch
Energy Systems Sector
Natural Resources Canada / Government of Canada

frederic.beauregardtellier@nrcan-rncan.gc.ca / Tel: 613-769-3208

Chers collègues,

Je vous écris pour inviter des représentants de votre département à participer à un groupe de travail sur le retraitement de combustible nucléaire usé.
Le Canada n'a pas de politique ni d'analyse interne formelle sur le retraitement commercial, y compris le traitement des combustibles usés. Bien que l'énergie et la technologie nucléaires, ainsi que la non-prolifération nucléaire, soient essentielles dans ce domaine, il s'agit d'un sujet qui recoupe les mandats de nombreux ministères. Les efforts de ce groupe de travail, dirigé par RNCan, produiront une analyse interne approfondie et bien documentée sur le retraitement de combustible nucléaire usé afin d'étayer les décisions futures relatives au cycle du combustible nucléaire au Canada.

Ce travail ne constitue pas l'élaboration d'une politique pour le retraitement de combustible nucléaire usé, mais plutôt une consolidation des efforts du gouvernement fédéral pour comprendre les risques et les avantages associés à cette technologie. Une description de l'analyse prévue et de la raison d'être de cette entreprise se trouve dans le mémoire ci-joint (en anglais seulement).

Si vous pouviez demander aux membres de votre équipe qui sont intéressés et en mesure de participer de remplir le questionnaire ci-dessous, nous vous serions reconnaissants de lancer ce travail avant les fêtes de fin d'année.

https://doodle.com/meeting/participate/id/avYOMAge

Nous vous remercions de votre soutien et de votre expertise en la matière, car nous cherchons à mieux comprendre les risques et les avantages du retraitement de combustible nucléaire usé en tenant compte de tous les points de vue au sein du gouvernement du Canada.

Je vous remercie de votre collaboration,

Frédéric Beauregard-Tellier
Directeur général, direction de l'énergie nucléaire et de la sécurité des infrastructures
Secteur des systèmes énergétiques
Ressources naturelles Canada / Gouvernement du Canada
Frederic.beauregardtellier@nrcan-rncan.gc.ca / Tél: 613-769-3208

Reprocessing Brief – November 2023

A Framework for Used Fuel Reprocessing: an analysis to support future decisions related to Canada's nuclear fuel cycle.

ISSUE: Canada does not have a specific policy or a formal internal analysis on commercial reprocessing, including used fuel processing. A series of public statements qualifying used fuel processing under a variety of funding sources (investment tax credits, strategic innovation fund contribution) has also resurfaced this sensitive topic in the public and media domain. **As we look to build out the next generation of nuclear, it is important that the Government of Canada is well positioned to make informed decisions related to all aspects of nuclear energy, including advanced nuclear fuel cycles. The proposed framework will be a thorough and well documented internal analysis to support future polices/decisions on reprocessing.**

The proposed path forward will be particularly important if Canada realizes its full nuclear ambitions, as these installations will have a significant impact on the volumes of extracted resources and the corresponding used nuclear fuel, potentially influencing the value of a closed vs. open nuclear fuel cycle in the decades to come. Work done today in the development of a framework to understand reprocessing will enable future sound and rational choices about this evolving technology and its role in the nuclear energy landscape. **This work does not constitute the development of a policy for used fuel reprocessing, rather the documentation of the federal governments efforts to understand the risks and benefits associated with the technology**.

An advanced nuclear fuel cycle in Canada – considerations for an open or a closed fuel cycle.
The question on if to reprocess used nuclear fuel is that of an open or closed fuel cycle – a once through utilization of fuel [current status quo for CANDU reactors] or a cycle that implements recycling of fuel [advanced fuel cycle – requires reprocessing]. The consideration of implementing a closed fuel cycle is one for the long term;

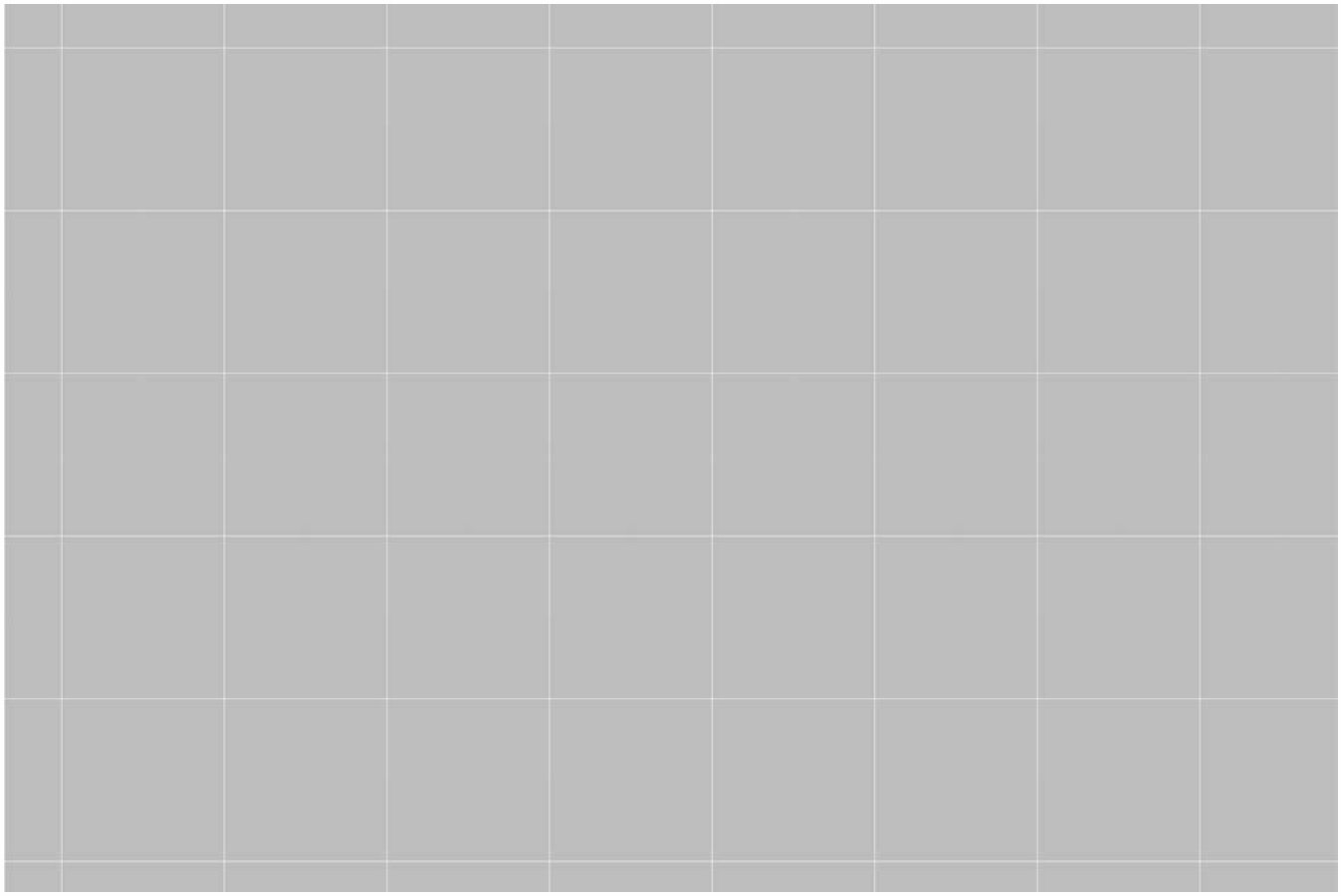
- This exercise should not be considered as the Government of Canada taking any initiative towards the implementation of reprocessing, or a closed fuel cycle. This is an exercise in due diligence for long-term planning related to Canada's nuclear sector.
- The deployment of used nuclear fuel reprocessing is a sensitive topic of discussion due in large part to the proliferation risks and associated safeguards, and the novel, and likely complex, radioactive waste streams. The proposed analysis will evaluate both risks and benefits.

What are the objectives in completing this work?

- In Canada, matters that relate to nuclear activities and substances are under the jurisdiction of the Government of Canada. NRCan is responsible for determining Canada's domestic nuclear energy policies, including those that concern radioactive waste and fuel. This would also include reprocessing.
- Current policies that relate to reprocessing include:
    - Policy for Radioactive Waste Management and Decommissioning
    - Policy on Enrichment
    - Nuclear Non-Proliferation Policy [GAC lead]

Proposed approach for development of a framework for reprocessing:

In the 1973 uranium enrichment policy, the Government of Canada issued a policy statement that sets out its "attitude towards the establishment of uranium enrichment facilities in Canada", and was based on a study that concluded in 1971. The statement indicates that if an enrichment plant proposal was shown to be in the national interest, the government would consider such proposals against a set of factors. Considering a proposal in the mid-1970s, an MC was prepared that outlines that these factors were assessed by an interdepartmental committee of the day, concluding that "the construction of an enrichment plant in Canada [to produce enriched uranium] for the export market is less attractive in 1976 than in 1971. **However, there is potential for a Canadian enrichment plant in future**." This analysis demonstrated the utility of the technology agnostic, proposal specific, uranium enrichment policy.



Next steps and summary of approach

Short term (1-2 months):

- Reach out to OGD colleagues (GAC, ECCC, CNSC, ISED, TC, HC) to establish working level working group, commitment to participate and contribute.
- Kick-off meeting seeking consensus and comment on proposed workplan and criteria, establishing clear scope of work.
- Finalize criteria framework for internal analysis.

Medium term (3-6 months):

- Draft papers and analysis undertaken for each criterion.
- Consult and collaborate with relevant departments for each analysis – for example – GAC on non-proliferation, CNSC on regulatory frameworks.

Long term (6-10 months)

- Finalize analysis, develop executive summary document outlining conclusions, in consultation with relevant departments.
- Consolidate findings into analysis framework mirroring 1970s enrichment policy.
- Assessment of current internal and external conditions to determine if a public process is desired/needed:
    - If yes, proceed with planning for transparent, public facing policy-development process, utilizing completed analysis to inform discussion papers and engagement materials.
    - If no, circulate internal analysis with OGD colleagues and create formal note to file for NRCan that articulates internal results.

Outcome at 10-12 months: informed internal analysis on commercial used fuel reprocessing in Canada over the short, medium, and long term, with well supported documentation that, should the need arise, can be used to develop a public facing position for the broader Government of Canada. Work to this point is maintained exclusively within the federal family, and remains consistent with, and cognizant of, other domestic and international objectives within the nuclear fuel cycle (accessing enriched materials to meet the immediate needs of SMR deployments). Any steps towards policy development would be sought from the government of the time, including consideration for an open and transparent engagement with the public, interested Canadians, Indigenous Peoples, and industry.

Aquilina, Dominic (ISED/ISDE)

From: Aquilina, Dominic (ISED/ISDE)
Sent: September 29, 2023 12:08 PM
To: Surphlis, Scott (ISED/ISDE); Baron Delaney; Torre, David (he, him | il, le) (ISED/ISDE)
Cc: Hiscock, Julia (ISED/ISDE); Carleton, Danika (ISED/ISDE); Kavanagh, Steve (ISED/ISDE)
Subject: RE: Quick Qs - CGH - Moltex Energy (September 2023)
Attachments: Moltex_federal_ask Sep 2023_v3.pdf; Tab 5. Briefing Package (Moltex).doc

Looping in my colleague from ISED's Industrial Decarbonization Team, David Torre, whom I believe has had recent engagement with Moltex.

Dominic

From: Surphlis, Scott (ISED/ISDE) <Scott.Surphlis@ised-isde.gc.ca>
Sent: September 29, 2023 10:47 AM
To: Baron Delaney <Baron.Delaney@nrcan-rncan.gc.ca>; Aquilina, Dominic (ISED/ISDE) <dominic.aquilina@ised-isde.gc.ca>
Cc: Hiscock, Julia (ISED/ISDE) <Julia.Hiscock@ised-isde.gc.ca>; Carleton, Danika (ISED/ISDE) <Danika.Carleton@ised-isde.gc.ca>; Kavanagh, Steve (ISED/ISDE) <steve.kavanagh@ised-isde.gc.ca>
Subject: Quick Qs - CGH - Moltex Energy (September 2023)

Hi Baron and Dominic –

I'm reaching out with a couple of quick questions re: Moltex Energy and their development of small modular reactor technology in New Brunswick.

Moltex's CEO, Rory O'Sullivan, recently reached out to Surita [redacted] WAste To Stable Salts (WATSS) spent nuclear fuel processing tech. with real spent fuel. Through their correspondence, [redacted]

We're aware of the funding that Moltex received from the federal government in 2021 (i.e. $47.5M through SIF in 2021 to support the development of their Stable Salt Reactor-Wasteburner (SSR-W), $3M through ACOA programming to support their SMR tech.) and that the company is a Clean Growth Hub client. I also understand that the company met with MIN Ng in April 2023 and that CGH supported that briefing (briefing package attached). During the April meeting, I believe that there was reference from Moltex [redacted] the attached.

We've reached out to our SIF and ACOA NB colleagues to seek additional information/ insight [redacted] However, I also wanted to check-in and inquire:

- Whether Moltex has reached out to the CGH on the topic [redacted] If so, any intel that you can share would be very much appreciated. If not, we'd be grateful for any insight/ background that you feel would be valuable ahead of this engagement.

- Baron – are you aware of any additional engagement between the company and other NRCan/ OGD (e.g. ECCC) colleagues?

- Dominic – very happy to engage with a member of your team on this request. Please let us know if you have any thoughts.

At this time, it looks like Surita and Rory will be meeting next Friday, October 6; however, this may change. As such, any background that you can share early next week would be greatly appreciated.

Alternatively, happy to connect via Teams or a quick call if you'd like!

Thanks,

Scott Surphlis

Senior Economist and Analyst, Strategy and Innovation Policy Sector – Atlantic Region
Innovation, Science and Economic Development Canada
scott.surphlis@ised-isde.gc.ca / (902) 483-4879

Économiste et analyste principal, Secteur de la stratégie et de la politique d'innovation – Région de l'Atlantique
Innovation, Sciences et Développement économique Canada
scott.surphlis@ised-isde.gc.ca / (902) 483-4879

s.20(1)(b)

s.20(1)(c)

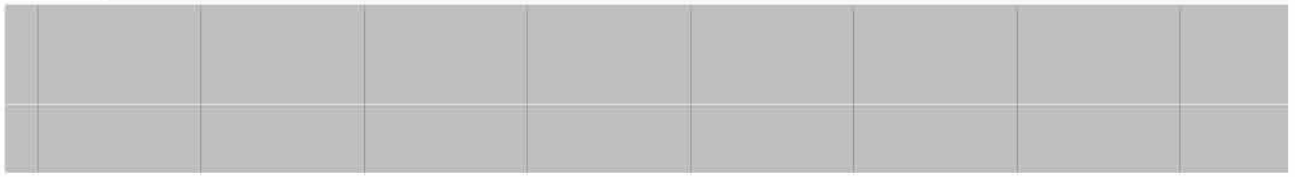
moltex
clean energy

Federal government support to demonstrate waste recycling technology

Moltex has made significant advancements since moving its business and intellectual property to Canada in 2018. However, it is now clear that despite extensive customer interest in North America, private sector finance is not available to demonstrate the technology. The WATSS waste recycling process has been successfully demonstrated by Moltex with surrogate spent fuel. The expensive spent fuel demonstration tests that customers and investors need to see, using irradiated CANDU fuel, have not yet been completed. In Canada, these can only be done at the Chalk River nuclear laboratory.

Higher interest rates have caused funds to move capital away from hard tech.

The Impact Assessment process drives timelines that are too long.



The SIF funding mechanism reduces risks for the private sector but the private sector still has to lead and put up the cash first. This is a First of a Kind endeavour with a promising new technology that has an outstanding upside but has substantial risk.

If Canada wants to see this technology demonstrated and deployed in Canada, a different form of federal support is needed t[redacted]. Moltex is essentially in the 'valley of death' between academia and private investment. This is compounded by the fact that it is a mega project that requires larger investments than almost any other sector – albeit with commensurately large returns.

Moltex is the only Canadian SMR technology being developed with a utility. It is currently the only opportunity the federal government has of ensuring there is at least one fully Canadian SMR. Moltex is the only SMR technology that is not subject to US export control restrictions.

The Moltex technology will be the world's first reactor to fully recycle nuclear waste, and the only technology that can reduce all man-made, long-lived transuranic elements.

s.20(1)(b)

s.20(1)(c)

moltex
clean energy

Returns for Federal Government

Moltex will also help Canada and the world affordably, safely decarbonize, meet NB's 2035 electricity targets and Canada's 2050 targets. This benefits all Canadian past and future nuclear utilities.

Maintain the technology, IP and jobs in NB and Canada

Canada can verify if recycling is – or is not – a real alternative or complement to direct disposal. Without this research, that question will always be asked by DGR intervenors.

Be the world's first to demonstrate a solution to nuclear waste – safely and sustainably - and export the technology globally, instead of importing it later. It is applicable to all of today's commercial reactors globally, not just CANDU.

Ensure existing investment is not wasted and avoid political fallout.

Technology Benefits

Significant reduction, and ultimately close to elimination, of all long-lived, man-made transuranic radioactive elements from nuclear waste.

Safe, low-cost, on-demand energy.

Energy security – using the value of the spent fuel assets already in Canada.

Increased value of CANDU technology by demonstrating it can be first in the world to fully close the fuel cycle – while maintaining international proliferation commitments.

Ask

in two tranches subject to milestones, to demonstrate the primary extraction stage of the WATSS process with spent CANDU fuel at the Chalk River lab. This assumes matched funding per current SIF contract. Moltex will streamline its activities to focus on WATSS and
The funding mechanism is flexible but the need is urgent.

Commitment to discuss longer term partnership to ensure technology is deployed in Canada – provided it continues to show techno-economic promise. Examples include a Joint Venture with Canada, the DOE and multiple utilities all sharing the risk.

BRIEFING PACKAGE
Minister Ng Meeting with representatives from Moltex Energy

OBJECTIVE/DESIRED OUTCOME

To reiterate the federal government's commitment to supporting the advancement of clean technologies, including small modular reactors, as part of Canada's net-zero goals and to learn how Moltex is supporting the development of Canada's SMR ecosystem.

BACKGROUND INFORMATION

SMALL MODULAR REACTORS

- Small modular reactors, or SMRs, are small, next generation nuclear reactors, designed to be cheaper, safer and easily transported and assembled, compared to conventional nuclear reactors.
- In addition to providing clean electricity to Canada's grids, SMRs have the ability to produce high-process heat that can help decarbonize heavy industry. The technology can also replace the use of diesel in remote communities and mines.
- Moltex is one of several SMR vendors in Canada looking to deploy their technology to support Canada's clean energy transition.

FEDERAL SUPPORTS

- The Government of Canada announced $50.5 million in funding for Moltex in 2021:
    - A $47.5 million repayable contribution from the Strategic Innovation Fund (SIF) to support the development of the company's Stable Salt Reactor – Wasteburner. This technology aims to produce emissions-free energy using spent nuclear fuel that has been recycled through their waste-to-stable salt process.
    - A $3 million conditionally repayable contribution from ACOA's Business Scale-up and Productivity program to demonstrate their small modular reactor (SMR) technology.
- Moltex represents one of three SMR projects funded by the SIF. Innovation, Science and Economic Development Canada (ISED) also publicly announced funding for SMR projects by Terrestrial and Westinghouse through the program.
- The Canada Infrastructure Bank contributed $970 million to GE Hitachi's SMR design (ON).
- Budget 2022 allocated $69.9 million for Natural Resources Canada (NRCan) to undertake research to minimize waste generation from these reactors; support the creation of a fuel supply chain; strengthen international nuclear cooperation agreements; and enhance domestic safety and security policies and practices. In February 2023, NRCan launched the Enabling Small Modular Reactors Program, which allocates $29.6 million to contribute to addressing SMR-generated waste, developing supply chains and securing fuel supply.
- Several provincial governments have also signalled strong support for SMRs, with Ontario, New Brunswick, Saskatchewan and Alberta releasing the *Strategic Plan for the Deployment of Small Modular Reactors*.

PAST ENGAGEMENTS

- Representatives from Moltex met with ISED representatives at the Cleantech Forum North America in January 2023. Moltex is a client of the department's Clean Growth Hub.
- Recently, the Clean Growth Hub facilitated an introduction to John Moffet, the ADM of the Environmental Protection Branch at ECCC and shared information about relevant federal programs.

POINTS TO REGISTER

- The federal government recognizes that SMRs represent a promising area of innovation as the country looks to transition to a net-zero economy.
- Through Budget 2023, the federal government has indicated support for the role of nuclear power in Canada's clean energy transition.
    - The first notable announcement was the Clean Electricity Investment Tax Credit, a 15 percent refundable tax credit for eligible investments in non-emitting electricity generation systems, including nuclear.
    - The second was the Investment Tax Credit for Clean Technology Manufacturing, equal to 30 percent of the cost of investments in the manufacturing of nuclear energy equipment and the processing or recycling of nuclear fuels and heavy water.
- Moltex Energy Canada was one of three companies specifically mentioned in Budget 2023 as an example of the Strategic Innovation Fund's investments in significant clean energy projects.
- I am confident that the federal government's investment in Moltex will strengthen Canada's leadership in the development of SMR technologies, and help Moltex achieve its goal of securing its first customer in Canada, a critical step towards global commercial deployment;

RESPONSIVE LINES – AVAILABLE PROGRAMMING

- I understand you are a client of our Clean Growth Hub services and that they are helping to direct you to relevant programs and contacts at NRCan and Environment and Climate Change Canada. I encourage you to continue to work with the Hub.

Prepared By: Patrick Hum
Name

613-899-1657
Telephone

Approved By: Andrew Noseworthy
Assistant Deputy Minister

March 29, 2023
Date

ANNEX A

Organization Profile

- Moltex Energy Canada Inc. is a developer of a next-generation nuclear reactors intended to provide clean electricity. It is headquartered in Saint John, New Brunswick, and has been operating in Canada since 2017. Its parent company is based in the U.K.
- Moltex's Stable Salt Reactor – Wasteburner (SSR-W) SMR design is a molten salt reactor that can be used to generate on-grid electricity and produce high-grade heat. Unlike other SMR technologies, the design is unique in that it recycles fuel from existing nuclear power reactors, which is then used to produce more clean energy.
- Ontario Power Generation's Centre for Canadian Nuclear Sustainability (Government of Ontario) provided $1 million in funding in March 2021 for the demonstration of the technical viability of a new process to recycle used CANDU fuel.
- New Brunswick Power committed $10 million in funding in 2018 towards the establishment of an advanced SMR Research Cluster in New Brunswick, and selected Moltex as a vendor (one of two) to progress development of its reactor technology in the province, with the aim of deploying its first reactor at the Point Lepreau nuclear site by the early 2030s.

BIOGRAPHY

Rory O'SULLIVAN, Chief Executive Officer, Moltex Energy

Rory O'Sullivan is the CEO at Moltex. He joined the company as Chief Operating Officer in the U.K. in 2015 before moving to Canada in 2018 to expand its operations into North America. The company has since made innovative technological advances while securing government funding and essential support from industry as well as community and Indigenous groups. Rory sat on the International Atomic Energy Agency's advisory committee on molten salt reactors and was a Forbes 30 Under 30 Standout. He has a background in Mechanical Engineering with degrees from Ireland and France.

From: Clarke, Pamela (ISED/ISDE)
To: Mar, Amy (ISED/ISDE)
Cc: Campbell2, James (ISED/ISDE); Di Palma, Gabriel (he, him | il, le) (ISED/ISDE); Pietersma, William (he, him | il, le) (ISED/ISDE);
Subject: Moltex_update
Attachments: Moltex
Sent: 2023-09-12 3:53:49 PM

Hi Amy,

We have heard through IS down from MINO that Moltex This may be what they raise at tomorrow's meeting.

From our perspective,

We will know more details following tomorrow but IS is pulling a note together and James has been asked to provide a SIF project update. More requests and/or direction may follow.

Pam

From: Campbell2, James (ISED/ISDE) <James.Campbell2@ised-isde.gc.ca>
Sent: September 12, 2023 3:20 PM
To: Clarke, Pamela (ISED/ISDE) <Pamela.Clarke@ised-isde.gc.ca>; Pietersma, William (he, him | il, le) (ISED/ISDE) <william.pietersma@ised-isde.gc.ca>; Di Palma, Gabriel (he, him | il, le) (ISED/ISDE) <Gabriel.DiPalma@ISED-ISDE.GC.CA>
Subject: FW: Introduction to Moltex

From: White-Senack, Elizabeth (ISED/ISDE) <Elizabeth.White-Senack@ised-isde.gc.ca>
Sent: September 12, 2023 1:40 PM
To: Campbell2, James (ISED/ISDE) <James.Campbell2@ised-isde.gc.ca>
Cc: Torre, David (he, him | il, le) (ISED/ISDE) <david.torre2@ised-isde.gc.ca>
Subject: FW: Introduction to Moltex

Hi James, see attached –

Moltex

s.20(1)(b)

s.20(1)(c)

s.21(1)(a)

s.21(1)(b)

I'm a bit surprised by this given our recent discussions with the company. Were either of you aware? From recent SIF meetings with the company, I understood the following:

- Moltex WATTS,

James, would you be able to provide a brief summary of SIF project status (how much $ has been claimed, project milestones, etc.).

David, are you aware if Moltex Small Modular Reactors I'm also curious about Canadian SMR

I'll start prepping the backgrounder. Grateful for any details you can provide.

Thank you,
Elizabeth

From: O'Keefe, Paul (ISED/ISDE) <paul.okeefe@ised-isde.gc.ca>
Sent: September 12, 2023 1:00 PM
To: White-Senack, Elizabeth (ISED/ISDE) <Elizabeth.White-Senack@ised-isde.gc.ca>
Subject: FW: Introduction to Moltex

Hi Elizabeth, Kevin in MinO has a meeting with Moltex next Tuesday. Could you please pull together a brief backgrounder on Moltex

Thanks,
Paul

From: Howland, Andrea (ISED/ISDE) <Andrea.Howland@ised-isde.gc.ca>
Sent: September 12, 2023 11:26 AM
To: Groeneweg, Sheryl (ISED/ISDE) <sheryl.groeneweg@ised-isde.gc.ca>; O'Keefe, Paul (ISED/ISDE) <paul.okeefe@ised-isde.gc.ca>
Cc: Laferriere, Anik (ISED/ISDE) <Anik.Laferriere@ised-isde.gc.ca>
Subject: FW: Introduction to Moltex

Hi Paul,

As discussed on this morning's MINO call. Kevin mentioned wanting to connect in advance of his call with them next Tuesday, so will keep you in the loop should a meeting request come down.

Thanks,
Andrea

From: Ajmera, Rutvi (ISED/ISDE) <Rutvi.Ajmera@ised-isde.gc.ca>
Sent: September 12, 2023 11:24 AM
To: Howland, Andrea (ISED/ISDE) <Andrea.Howland@ised-isde.gc.ca>; Ray, Michelle (ISED/ISDE) <Michelle.Ray@ised-isde.gc.ca>
Cc: Koutros, Nicholas (ISED/ISDE) <nicholas.koutros@ised-isde.gc.ca>; Seraj, Nilou (she, her | elle, la) (ISED/ISDE) <Niloufar.Serajmehdizadeh@ised-isde.gc.ca>
Subject: Introduction to Moltex

Hi Andrea,

As discussed on the Advanced Manufacturing call today, please see attached the Moltex document.

Thanks,

Rutvi

moltex clean energy

Federal government support to demonstrate waste recycling technology

Moltex has made significant advancements since moving its business and intellectual property to Canada in 2018. However, it is now clear that despite extensive customer interest in North America, private sector finance is not available to demonstrate the technology. The WATSS waste recycling process has been successfully demonstrated by Moltex with surrogate spent fuel. The expensive spent fuel demonstration tests that customers and investors need to see, using irradiated CANDU fuel, have not yet been completed. In Canada, these can only be done at the Chalk River nuclear laboratory.

[redacted]

Higher interest rates have caused funds to move capital away from hard tech.

The Impact Assessment process drives timelines that are too long.

[redacted]

The SIF funding mechanism reduces risks for the private sector but the private sector still has to lead and put up the cash first. This is a First of a Kind endeavour with a promising new technology that has an outstanding upside but has substantial risk.

If Canada wants to see this technology demonstrated and deployed in Canada, a different form of federal support is needed [redacted]. Moltex is essentially in the 'valley of death' between academia and private investment. This is compounded by the fact that it is a mega project that requires larger investments than almost any other sector – albeit with commensurately large returns.

[redacted]

Moltex is the only Canadian SMR technology being developed with a utility. It is currently the only opportunity the federal government has of ensuring there is at least one fully Canadian SMR. Moltex is the only SMR technology that is not subject to US export control restrictions.

The Moltex technology will be the world's first reactor to fully recycle nuclear waste, and the only technology that can reduce all man-made, long-lived transuranic elements.

s.20(1)(b)
s.20(1)(c)

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Returns for Federal Government

Moltex will also help Canada and the world affordably, safely decarbonize, meet NB's 2035 electricity targets and Canada's 2050 targets. This benefits all Canadian past and future nuclear utilities.

Maintain the technology, IP and jobs in NB and Canada

Canada can verify if recycling is – or is not – a real alternative or complement to direct disposal. Without this research, that question will always be asked by DGR intervenors.

Be the world's first to demonstrate a solution to nuclear waste – safely and sustainably - and export the technology globally, instead of importing it later. It is applicable to all of today's commercial reactors globally, not just CANDU.

Ensure existing investment is not wasted and avoid political fallout.

Technology Benefits

Significant reduction, and ultimately close to elimination, of all long-lived, man-made transuranic radioactive elements from nuclear waste.

Safe, low-cost, on-demand energy.

Energy security – using the value of the spent fuel assets already in Canada.

Increased value of CANDU technology by demonstrating it can be first in the world to fully close the fuel cycle – while maintaining international proliferation commitments.

Ask

in two tranches subject to milestones, to demonstrate the primary extraction stage of the WATSS process with spent CANDU fuel at the Chalk River lab. This assumes matched funding per current SIF contract. Moltex will streamline its activities to focus on WATSS and get
The funding mechanism is flexible but the need is urgent.

Commitment to discuss longer term partnership to ensure technology is deployed in Canada – provided it continues to show techno-economic promise. Examples include a Joint Venture with Canada, the DOE and multiple utilities all sharing the risk.

From:	Poupore, Jessica
To:	Lin2, Cindy (she, her | elle, la) (ISED/ISDE); Campbell2, James (ISED/ISDE);
Cc:	Clarke, Pamela (ISED/ISDE); Di Palma, Gabriel (he, him | il, le) (ISED/ISDE); Mar, Amy (ISED/ISDE); Brady, Daniel;
Subject:	RE: Moltex - Due Diligence
Sent:	2023-10-19 9:24:59 AM

UNCLASSIFIED - NON CLASSIFIÉ

s.20(1)(b)

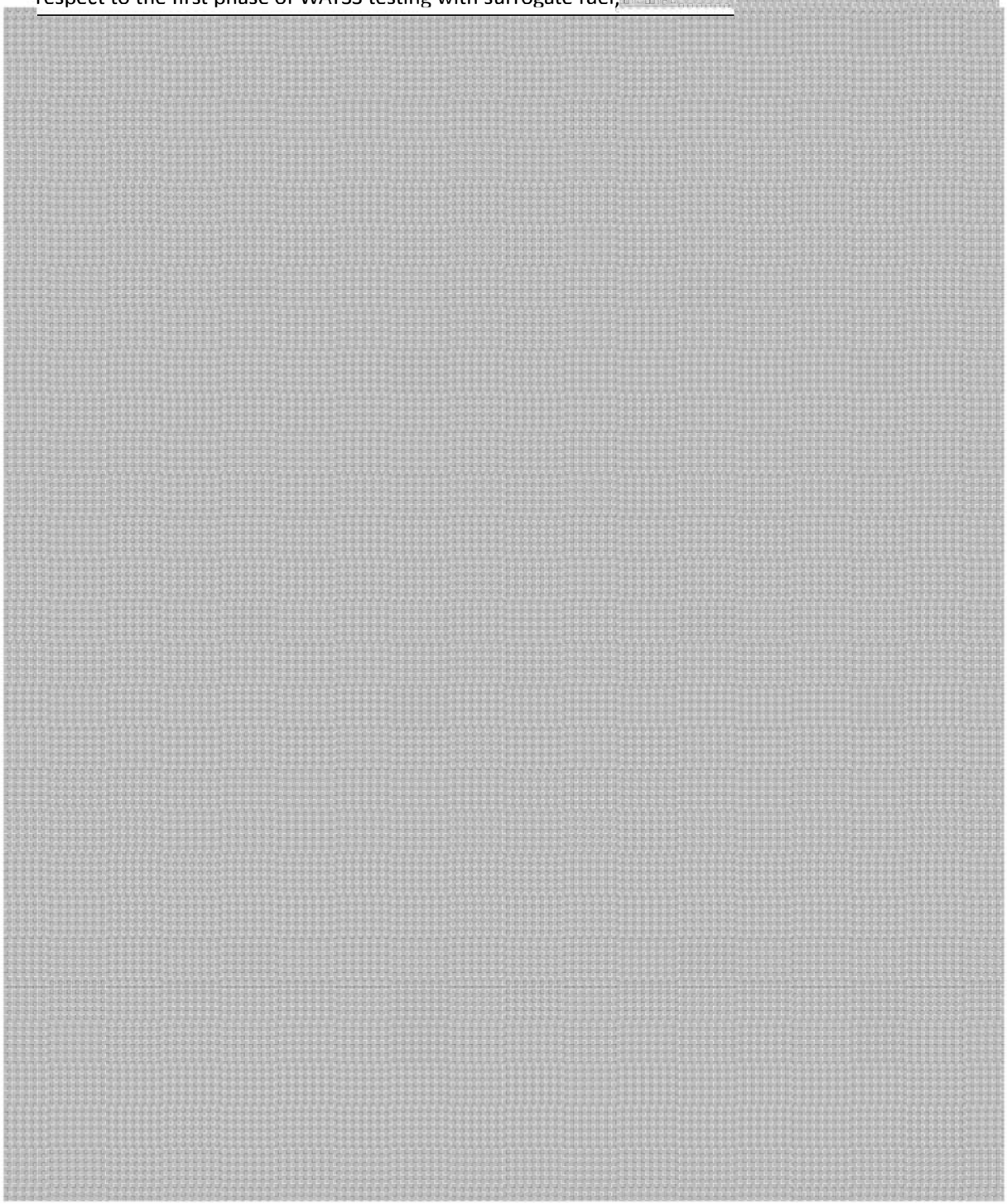
s.20(1)(c)

s.21(1)(a)

s.21(1)(b)

Hi Cindy,

Please see below for our responses to your questions regarding Moltex's WATSS project. With respect to the first phase of WATSS testing with surrogate fuel,



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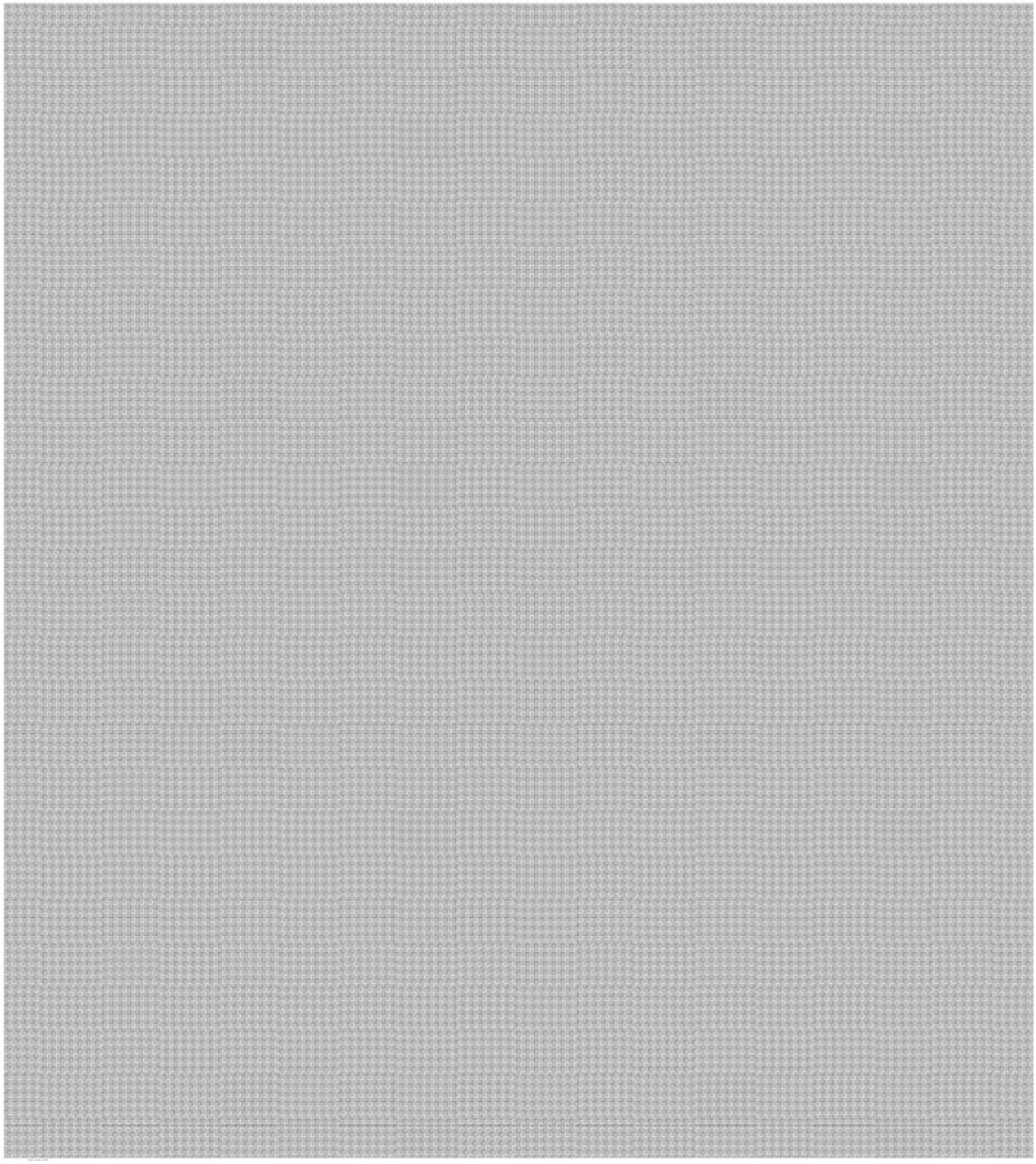
s.21(1)(a)

s.21(1)(b)



Happy to answer questions or provide clarification.

Best regards,
Jessica

Ressources naturelles Canada - Gouvernement du Canada
jessica.poupore@nrcan-rncan.gc.ca Mobile: 613-292-8981

From: Lin2, Cindy (she, her | elle, la) (ISED/ISDE)
Sent: October 16, 2023 8:34 AM
To: Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>
Cc: Clarke, Pamela (ISED/ISDE) <Pamela.Clarke@ised-isde.gc.ca>; Campbell2, James (ISED/ISDE) <James.Campbell2@ised-isde.gc.ca>; Di Palma, Gabriel (he, him | il, le) (ISED/ISDE) <Gabriel.DiPalma@ISED-ISDE.GC.CA>
Subject: RE: Moltex - Due Diligence

Hello Jessica,

Thank you for your response.

Attached is the market and technical due diligence report that was completed by NRCan back in 2019.

Have a nice day,

Cindy Lin
(she, her | elle, la)

Sr Investment Analyst, Strategic Innovation Fund
Innovation, Science and Economic Development Canada / Government of Canada
cindy.lin2@ised-isde.gc.ca / Tel: 343-597-4537 / TTY: 1-866-694-8389

Analyste princ. d'investissements, Fonds strategique pour l'innovation
Innovation, Sciences et Développement économique Canada / Gouvernement du Canada
cindy.lin2@ised-isde.gc.ca / Tél: 343-597-4537 / ATS : 1-866-694-8389

From: Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>
Sent: October 15, 2023 9:35 PM
To: Lin2, Cindy (she, her | elle, la) (ISED/ISDE) <Cindy.Lin2@ised-isde.gc.ca>
Cc: Clarke, Pamela (ISED/ISDE) <Pamela.Clarke@ised-isde.gc.ca>; Campbell2, James (ISED/ISDE) <James.Campbell2@ised-isde.gc.ca>; Di Palma, Gabriel (he, him | il, le) (ISED/ISDE) <Gabriel.DiPalma@ISED-ISDE.GC.CA>
Subject: RE: Moltex - Due Diligence

UNCLASSIFIED - NON CLASSIFIÉ

to answer your questions early this week, but we appreciate the urgency and will do our best. Thank you for the questions as this will help us focus the analysis.

I believe there was a technical review done a few years ago as part of the SIF application / funding agreement process. I wasn't able to find a copy in NRCan's records – could you please send me the original technical review? Daniel Brady was involved in the review at the time.

Many thanks,
Jessica

Jessica Poupore
(she/her/elle)

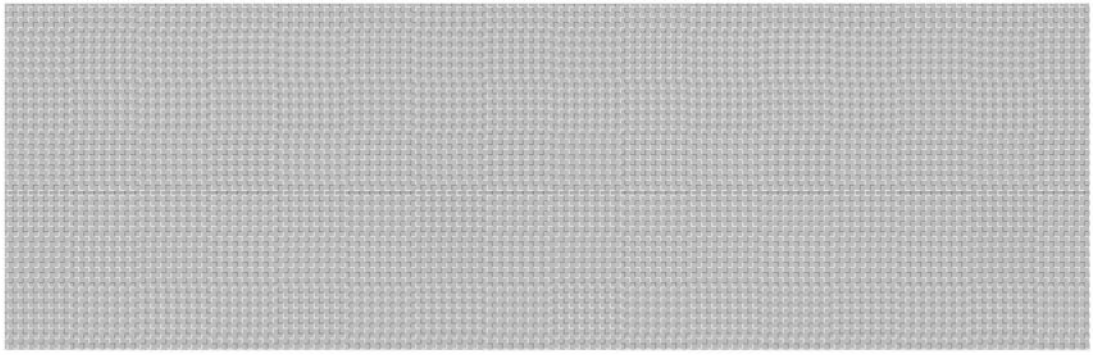
A/Deputy Director, S&T / Directrice adjointe p.i., science et technologie
Nuclear Energy Division / Division de l'énergie nucléaire

Natural Resources Canada - Government of Canada
Ressources naturelles Canada - Gouvernement du Canada
jessica.poupore@nrcan-rncan.gc.ca Mobile: 613-292-8981

From: Lin2, Cindy (she, her | elle, la) (ISED/ISDE) <Cindy.Lin2@ised-isde.gc.ca>
Sent: Sunday, October 15, 2023 9:26 PM
To: Poupore, Jessica <Jessica.Poupore@NRCan-RNCan.gc.ca>
Cc: Clarke, Pamela (ISED/ISDE) <Pamela.Clarke@ised-isde.gc.ca>; Campbell2, James (ISED/ISDE) <James.Campbell2@ised-isde.gc.ca>; Di Palma, Gabriel (he, him | il, le) (ISED/ISDE) <Gabriel.DiPalma@ISED-ISDE.GC.CA>
Subject: FW: Moltex - Due Diligence

Hi Jessica,

In James, absence, I wanted to follow-up on Dan's e-mail below. Dan has indicated that the report will likely not be ready till the end of next week. We would like to brief up early next week, so I was wondering if you would be able to provide your opinion on the following points prior to completing the report:



If it's easier to chat over MS Teams, please let me know. I will be happy to set one up.

Thank you for your help

Sr Investment Analyst, Strategic Innovation Fund
Innovation, Science and Economic Development Canada / Government of Canada
cindy.lin2@ised-isde.gc.ca / Tel: 343-597-4537 / TTY: 1-866-694-8389

Analyste princ. d'investissements, Fonds strategique pour l'innovation
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cindy.lin2@ised-isde.gc.ca / Tél: 343-597-4537 / ATS : 1-866-694-8389

-------- Original message --------
From: "Brady, Daniel" <daniel.brady@NRCan-RNCan.gc.ca>
Date: 2023-10-13 4:41 p.m. (GMT-05:00)
To: "Campbell2, James (ISED/ISDE)" <James.Campbell2@ised-isde.gc.ca>, "Poupore, Jessica" <Jessica.Poupore@NRCan-RNCan.gc.ca>
Cc: "Clarke, Pamela (ISED/ISDE)" <Pamela.Clarke@ised-isde.gc.ca>, "Lin2, Cindy (she, her | elle, la) (ISED/ISDE)" <Cindy.Lin2@ised-isde.gc.ca>, "Di Palma, Gabriel (he, him | il, le) (ISED/ISDE)" <Gabriel.DiPalma@ISED-ISDE.GC.CA>
Subject: RE: Moltex - Due Diligence

PROTECTED A - PROTÉGÉ A

Hi James

We are working to have a report done for later next week.

I am away next week, but Jessica (on this email) is leading the review. Please feel free to reach out to her.

dan

From: Campbell2, James (ISED/ISDE) <James.Campbell2@ised-isde.gc.ca>
Sent: Friday, October 13, 2023 10:30 AM
To: Brady, Daniel <daniel.brady@NRCan-RNCan.gc.ca>
Cc: Clarke, Pamela (ISED/ISDE) <Pamela.Clarke@ised-isde.gc.ca>; Lin2, Cindy (she, her | elle, la) (ISED/ISDE) <Cindy.Lin2@ised-isde.gc.ca>; Di Palma, Gabriel (he, him | il, le) (ISED/ISDE) <Gabriel.DiPalma@ISED-ISDE.GC.CA>
Subject: Moltex - Due Diligence

Good morning Daniel,

Hope you are doing well. It has been a while since we have been in touch on the SMR files and I understand that your work in that area is continuing, in particular with regards to due diligence on Moltex [redacted] We, too, are trying to

appreciated. If that is easier via a short MS Teams meeting I am happy to arrange it. I can be available any time today for a call if that works for you.

Thanks very much!

James Campbell
Investment Analyst
Innovation, Science and Economic Development Canada / Government of Canada
James.Campbell2@ised-isde.gc.ca / Tel: 613-406-4196

Analyste des investissements
Innovation, Sciences et Développement économique Canada/ Gouvernement du Canada
James.Campbell2@ised-isde.gc.ca / Tel: 613-406-4196

s.19(1)

s.20(1)(b)

s.20(1)(c)

From:	Rory O'Sullivan
To:	Clarke, Pamela (ISED/ISDE); Campbell2, James (ISED/ISDE); Mar, Amy (ISED/ISDE);
Cc:	Andrew Taylor; John Mauti;
Subject:	Moltex updated proposal
Attachments:	Moltex - A Canadian Strategic Priority - Nov 2023.pptx
Sent:	2023-11-14 7:20:31 PM

Follow Up Flag:	Follow up
Flag Status:	Completed

Dear James, Pamela and Amy,

We did the original estimate for the next phase of WATSS work around March 2023. Over the last month the team have been updating our estimates and we have just compiled them.

Costs have reduced so that [redacted] total is sufficient and conservative to complete the next phase of WATSS tests, associated engineering design and allow enough time to raise finance. With a [redacted] contribution from ACOA based on a [redacted] project we have enough to finance this.

The reason for the reduction in estimate primarily comes from risk reduction by further simfuel tests we have been doing in our lab over the past few months refining the scope and risk of the tests needed at CNL. We are also doing the rig design for CNL with their support instead of them doing it. This leads to significant savings also. We can then test the exact rig they will use significantly reducing risk of errors in their lab.

Please find attached the updated ask and proposal for ACOA. [redacted] We would be able to demonstrate finance up to June 2025. We do not need any special finance arrangement, the normal terms are sufficient. This work can be funded out of the Phase 2 funds.

It would probably be helpful to go over this on a call. A couple of options that work for us are 10am and 1pm ET Thursday. Please let us know of other options if they dont work.

On a separate note, we have just completed our formal report for the WATSS Phase 1 work which will be over to you in the next few days.

Rory O'Sullivan
Chief Executive Officer
+1 437 778 4232
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Moltex: A Canadian Strategic Priority

Advancing technology leadership in nuclear in response to stakeholder interests and needs

November 2023

CONFIDENTIAL & COMMERCIALLY SENSITIVE

Progress to date

- Moltex has made significant advancements since moving its business and intellectual property to Canada in 2018.
- The WATSS waste recycling process has been successfully demonstrated by Moltex with surrogate spent fuel.
- Moltex has received strong signals from the market, including letters of support from NBPower, OPG, NWMO, and industry partners that there is strong desire for this work to go forward and in validating the WATSS process.
- The expensive spent fuel demonstration tests that customers and investors need to see, using irradiated CANDU fuel, have begun and showed initial validation of the technical approach, but have not yet been completed.
- In Canada, these irradiated fuel studies can only be done at the Chalk River nuclear laboratory.
- Moltex has taken cost-cutting measures, streamlined and focused the business on validating the WATSS technology.
- Moltex is seeking CAD [redacted] from ACOA as a small incremental investment to ensure the work goes forward, which will enable Canadian government to answer any potential challengers of Canada's waste disposal plans with proof of having thoroughly explored all technically viable alternatives.

Project Description

To demonstrate WATSS technology in a high-radioactive environment using real, irradiated (spent) CANDU fuel. This project is a key component of the overall conceptual design of WATSS and will validate commercial viability of Moltex's proprietary technology to convert used nuclear fuel into recycled fuel for the SSR-W reactor and potentially other Gen-4 aSMRs.

Funding is required to prove concept design of Moltex's WATSS project, mainly R&D using hot cell laboratory at CNL and associated work. This work has been flagged by investors and nuclear operators who would be customers of the technology as the key milestone to pass to attract private investment.

Moltex is planning a revised experimental approach of 5 sequential extractions in a single experimental rig as opposed to the original plan of doing single-step extractions five times in five separate experimental rigs. This updated approach to the CNL hot cell experiments has the benefit of significantly reduced costs vs running multiple tests, both due to reduced up-front engineering and reduced time in the hot cell environment changing experimental rigs. Because of this, the original estimate (million for multiple CNL experiments and analysis is reduced to million.

The total eligible costs of the ACOA funding project will be of this total from ACOA funding

Expected Results

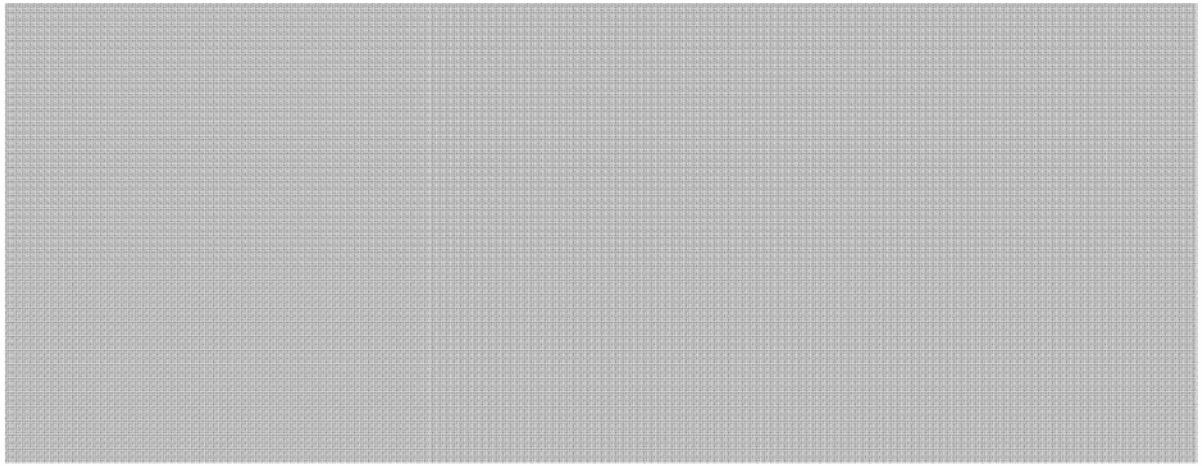
The activities within the scope of this project will be:

1. ***Single rig, performing 5 sequential extractions in the hot cell experiment at CNL***
2. ***Report demonstrating the analysis of the experiment***

The results of this project will lead to de-risking the WATSS technology and

Several factors

- Higher interest rates are causing investors to seek faster returns.
- The Impact Assessment process drives timelines that are too long.



Why existing SIF commitments to Moltex do not meet the need

- SIF funding reduces risk but is "match funding": the private sector must lead.
- This First of a Kind endeavour has outstanding upside but substantial risk.
- Different form of federal support is needed
- Moltex is in the 'valley of death' between academia and private investment.
- Nuclear requires larger investments – albeit with commensurately large returns.

Moltex's unique value proposition

- Moltex is the only Canadian SMR technology being developed with a utility.
- Currently the only fully Canadian SMR – all IP exclusively resides in Canada.
- The only SMR technology not subject to US export controls.
- The world's first reactor to fully recycle nuclear waste.
- Significant progress made and significant goodwill invested in the company.
- The small, incremental investment needed to complete the next phase of work is moderate and pragmatic given the size of prize for Canada of bringing this technology to market.

Returns for federal government

Moltex can help Canada and the world affordably, safely decarbonize to meet provincial and federal targets. This benefits all Canadian nuclear utilities.

Other returns on the government's investment in the next phase of work include:

- Maintain the technology, IP and jobs in NB and Canada.
- Verify whether recycling is an alternative or complement to direct disposal. Otherwise, that question can be used by intervenors to challenge the DGR.
- Be the world's first to demonstrate a solution to nuclear waste – safely and sustainably – and export the technology globally, instead of importing it later.
- It is applicable to the nuclear sector globally, creating exciting export potential and economic opportunity for the Canadian supply chain.
- Ensure existing investment is not wasted and avoid political fallout.

Technology benefits

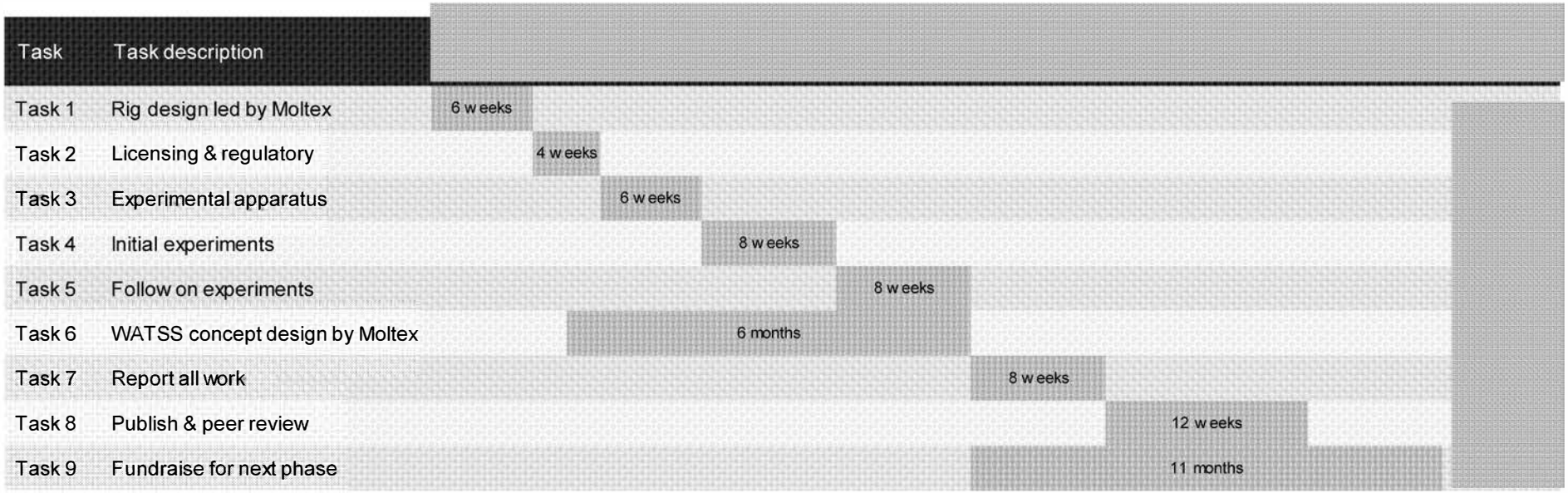
Moltex has received letters of support from NWMO and Canadian utilities and industry stakeholders corroborating their interest in this work going forward, based on the potential for:

- Significant reduction, and ultimately close to elimination, of all long-lived, man-made transuranic radioactive elements from nuclear waste.
- [redacted]
- Safe, low-cost, on-demand energy.
- Energy security, using the value of the spent fuel assets already in Canada.
- Increased value of CANDU technology by being the world's first to fully close the fuel cycle while maintaining international non-proliferation commitments.

Scope & timeline for project

Task	Task description		Est. duration	Complete by
Task 0	Project management and administration			
Task 1	Rig design	Led by Moltex	6 Weeks	
Task 2	Review and update from previous work of CNL licensing and regulatory requirements		4 Weeks	
Task 3	Fabrication, assemble & test/commission experimental apparatus		6 Weeks	
Task 4	Initial experimentation		8 Weeks	
Task 5	Follow on experiments		8 Weeks	
Task 6	WATSS facility concept engineering design	By Moltex	9 Months	
Task 7	Report all work		8 Weeks	
Task 8	Publish results and peer review		12 Weeks	
Task 9	Fundraise for next phase of work	In parallel with Tasks 7 & 8	9 Months	

Project Gantt chart



Moltex's ask to ACOA

- CAD [redacted] additional funding is required to demonstrate the primary extraction stage of the WATSS process with spent CANDU fuel at the Chalk River lab in addition to associated engineering design and cost estimates.
- Moltex will focus on increasing TRL of WATSS, unlocking private investment.
- Within the [redacted] scope of work, [redacted] from ACOA will enable the project to go forward and achieve key milestones.
- The funding need is urgent to maintain headcount internally and to keep laboratory work on track.
- Cost estimates and plan assumes Dec 1st 2023 start to June 30th 2025 completion.
- Key Milestones to achieve:

[redacted] from main stage of WATSS – or similar amount if demonstrated to be economically viable

  - Layouts and safeguards philosophies for a WATSS commercial facility

Sources & use of funds – ACOA WATSS used fuel Project

Category	Eligible Costs
COSTS	
Labour and contractors	[redacted]
Hot cell experiment (CNL)	
Other (operating)	
TOTAL	
SOURCES	
ACOA	[redacted]
Moltex	
TOTAL	

Moltex's ask to SIF

- [redacted]
- ACOA and Moltex funding used to complete WATSS work and raise finance for completion of SIF project.
- Cost estimates and plan assumes Dec 1st 2023 start to June 30th 2025 completion.
- Key Milestones to achieve:
  - [redacted] from main stage of WATSS – or similar amount if demonstrated to be economically viable
  - Complete WATSS concept commercial facility design, with independent peer review plus associated cost estimates
  - Series A funding received for subsequent SIF work.

Sources & use of funds – SIF WATSS concept project

Category	Eligible Costs
COSTS	
Labour	[redacted]
Hot cell experiment (CNL)	
Engineering contractors	
Other (operating)	
TOTAL	
SOURCES	
ACOA hot cell project funds	[redacted]
SIF match funds dedicated to WATSS engineering	
Moltex	
TOTAL	

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Thank you

Rory O'Sullivan, CEO

[redacted]@moltexenergy.com

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Appendix

CNL work costs detail

Task	Cost	Reference*	Notes
Task 1 Design		Table 4a T1	Moltex now doing rig design work. Small allowance for CNL to review.
Task 2 CNL licensing and regulatory		Table 4a T2	This has been done and just needs updating from the last time. 50% assumed.
Task 3 Rig assembly and commission		Table 4a T3	
Task 4a Experiment 1		Table 4a T4 A4.1-6	
Task 4b Experiment 2		Table 4a T4 A4.1-6	
Task 5 Confirmation experiment		Table 4c	
Task 6 Extra sampling		Table 4b	
Task 7 Waste disposal		Table 4a A4.9	
TOTAL			

Summary

- Moltex has the exclusive, global license to unique, patented technology that can turn spent nuclear fuel into round-the-clock, zero-emission power or clean hydrogen.
- The Company's "disposal to value" business model is to sub-license its fuel recycling and 500 MW small modular reactor (SMR) technology to investment grade utility and government customers, in order to generate attractive, long-dated, high-quality cash flow for Moltex shareholders.
- The Company believes that the U.S. and Canada alone represent a total addressable market (TAM) of US$200 billion, supporting more than 50 license opportunities over the next 50 years. Globally the Company sees a US$500+ billion per year opportunity as nuclear power continues to expand in key growth markets.
- The Company's patent-protected, first mover advantage, backed by utility investors and commercial stakeholders, gives it captive access to a substantial supply of spent nuclear fuel that companies and governments must either recycle or store in expensive deep repositories.
- About US$70 billion has been earmarked in the U.S. and Canada for spent nuclear fuel solutions, providing robust support for the Moltex business plan and growth strategy.
- Building just one Moltex 500 MW, zero-carbon, baseload power plant using recycled spent nuclear fuel could save about 1.7 million metric tons of CO_2 emissions per year, which is equivalent to taking about 375,000 automobiles off the road.

Business, financing plan update (1)

Moltex Energy Canada, Inc. ("Moltex" or the "Company") is developing two complementary technologies:

- Waste to Stable Salt ("WATSS"), a process that recycles spent nuclear fuel, currently in storage, as fuel for the Company's SMRs.
- Stable Salt Reactor-Wasteburner ("SSR-W"), a 300-500MW SMR, fueled with spent nuclear fuel recycled using the WATSS process.

In Canada, Moltex believes that the , and the value of the clean, carbon free energy that can be produced from Canada's nuclear waste is in the range of C$150 billion to $200 billion. All of the Moltex intellectual property is exclusively licensed from Moltex Energy Ltd., the parent company based in the UK.

Moltex has also developed a close, strategic, working relationship with SNC-Lavalin Group SNC is the steward of CANDU® nuclear technology, operating on four continents, and provides advisory and engineering services to other nuclear developers. SNC has completed an extensive third-party due diligence report, has agreed to chosen Moltex as its go-to-market SMR partner.

The targeted capital cost of the Company's SMRs is in the range of US$2,500 per kW of capacity, with a baseload LCOE in the range of US$50 per MWh. In addition, the Moltex family of technologies is synergistic with CANDUs, Spent nuclear fuel from 2GWs of CANDU reactors should be able to power approximately 1GW of Moltex reactors.

Business, financing plan update (2)

The Company's business units include:

- Moltex Energy Canada Inc. based in Saint John, New Brunswick. To date, the Company has received comprehensive stakeholder support (Federal Government, Provincial Government, New Brunswick Power (customer), Canadian First Nations approvals and small equity investment commitment, and EPCM partners). Conditionally repayable loans (essentially grants) total C$63 million to date, to pay for research and development, detailed design, and licensing of WATSS and SSR-W. In addition, the Canada Infrastructure Bank ("CIB") has given the Company a written indication of interest in financing its SMRs. In June 2018 the Company received its first MOU, and in January 2021 it received its second and confirming MOU, from New Brunswick Power Corporation ("NB Power"), to build its first commercial SSR-W facility at NB Power's Point Lepreau Nuclear Generating Station. SNC-Lavalin has recently completed a due diligence engineering report with respect to the Company's technologies, [redacted] decision to partner with the Company.
- Moltex Energy USA LLC ("Moltex USA"), has been awarded US$6.7 million in grants by the U.S. DOE's ARPA-E program related to construction techniques and cost estimates. It is envisaged that Moltex USA will commercialize the Company's technologies in the U.S. The Company has been working closely with a large U.S. utility with respect to a strategic alliance and an investment in the PIPE.

Financing plan: The funding and timeline in the current plan allow [redacted] to complete a private raise following experiment results. Current partners and potential investors have signaled willingness to invest following successful WATSS experiment outcomes and the plan includes concurrent focus on the next raise while publishing and peer-reviewing the results of the ACOA hot cell project.

- Further, Moltex is committed to discuss longer term partnership with the Government of Canada to ensure technology is deployed in Canada. Examples include a Joint Venture with government and industry sharing risk.

Unique WATSS process – spent nuclear fuel recycling

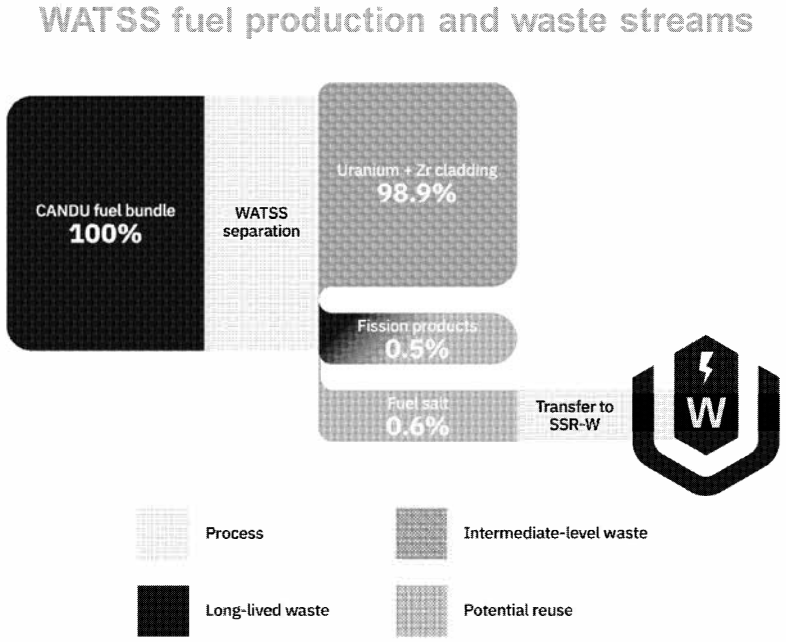
Composition of spent nuclear fuel bundles:

- 99% is intermediate level waste, 0.5% is short-lived fission products
- 0.6% is long-lived actinides that can be used as fuel in the SSR-W

Moltex unique and proprietary intellectual property:

- Reduces nuclear fuel storage costs
- Recycles spent fuel for use in Moltex or other SMRs (1)
- Is radically cheaper and simpler than traditional reprocessing
- Output is not suitable for weapons use

There is currently enough spent nuclear fuel being stored in Canada to power at least 8 GW of Moltex SMRs for 60 years.



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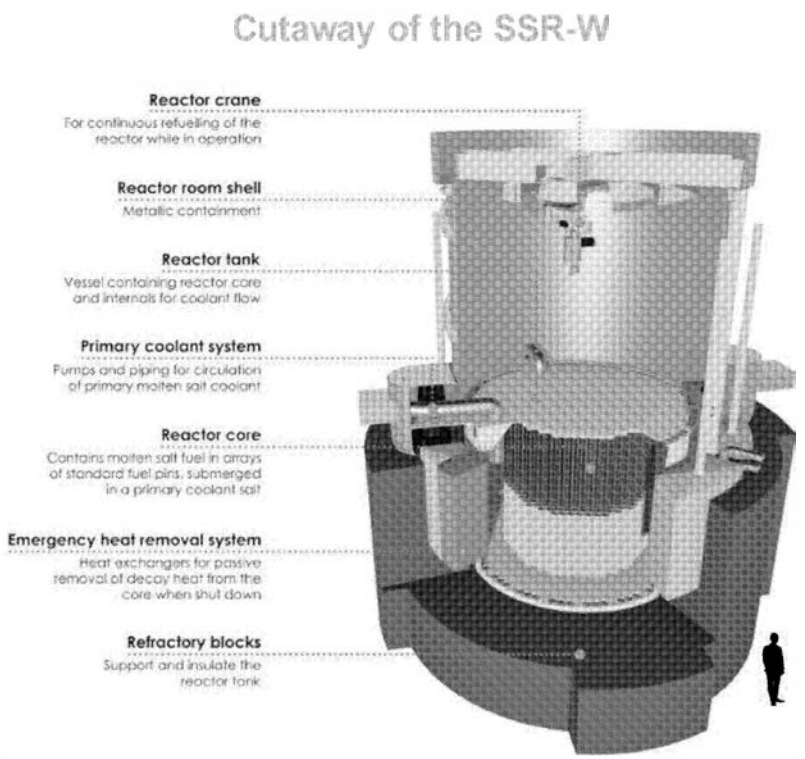
Core technology – SSR-W small modular reactor

Key patents and intellectual property

- Moltex's breakthrough innovation is to contain the molten salt fuel within conventional fuel rods.
- While all molten salt reactors offer significant safety benefits over standard reactors, most other molten salt designs introduce a whole new set of problems by circulating highly corrosive fuel salts throughout their systems.
- By confining the molten salt fuel to conventional fuel pins, Moltex avoids a slew of costly and complex challenges facing other molten salt reactor developers.
- Moltex has an exclusive license of the relevant patents for the technologies and owns all other relevant IP.



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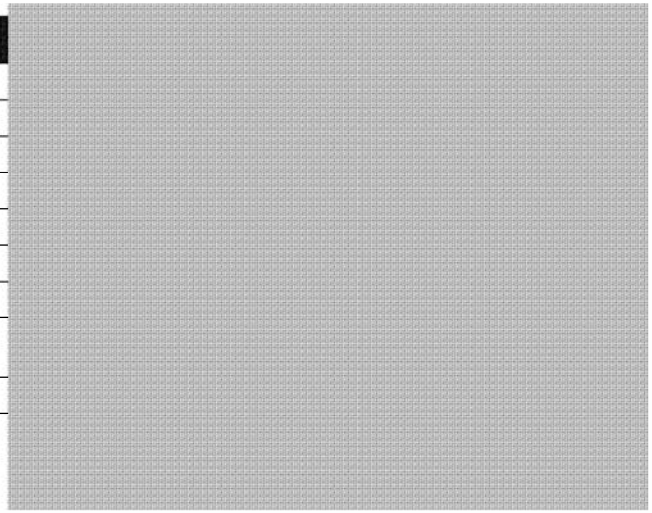
Competitive landscape: SMRs advancing in North America*

Vendor	Moltex
Reactor	SSR-W
Electric power (MWe)	500
Output temp (°C)	590
Fuel type	Static molten salt
Fuel purity required	Low
Fuel available	Yes
High level waste	Decrease
Meltdown mitigation	Hazards inherently avoided
Licensing / Regulations	Completed VDR1, prepping for VDR2
Regulatory overhaul required for FOAK	No
Site / Project for FOAK	Yes
LCOE $US/MWh	$53
Valuation	£120M post-money of parent company, 2019

Spent nuclear fuel recycling or reprocessing comparison*

Vendor	Moltex
Process	WATSS
Spent fuel input	LWR or CANDU or SFR
Fuel output purity	Low
Intended use	SSR-W fuel
Proliferation risk	Extremely low
Low level waste production	No change
Long lived waste production	Potential near elimination
Throughput (Capex in CAD)	CANDU: 1410tHM p.a. ($1.39B) LWR: 470tHM p.a. ($1.39B)
Infinite recycling possible	Yes



*Two other lesser-known processes called COEX and GANEX have been proposed but are seen as inferior and more expensive than Purex or pyroprocessing
LWR - light water reactor; SFR - sodium fast reactor; MSR - molten salt reactor; MOX - mixed oxide fuel; tHM/a - tonnes heavy metal per annum

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Unique IP licensed to the Company

The Company has an exclusive, global, perpetual, fully paid-up license in the relevant field of use for the following patents. The Company owns all other IP. The Company believes that no other IP licensing is required.

Primary patent (PCT/GB2014/050481) (US10043594B2)

The first patent filed by Dr. Scott (priority date before the parent company, Moltex Energy Ltd.'s founding) is considered the Company's "main" patent, protecting its core technological idea, which is that Moltex's unique reactor design places the radioactive fuel, still bound as a molten salt like other similar reactors, but within hollow fuel tubes, thus keeping the molten salt fuel separate from the molten salt coolant. The patent has a wide jurisdictional coverage (US, EP, GB, CA, JP, KR, CN, RU, AU, HU).

Abstract

A nuclear fission reactor comprising a core, a pool of coolant liquid, and a heat exchanger. The core comprises an array of hollow tubes which contain molten salts of fissile isotopes. The tube array is at least partly immersed in the pool of coolant liquid. The tube array comprises a critical region, where the density of the fissile isotopes during operation of the reactor is sufficient to cause a self-sustaining fission reaction. Heat transfer from the molten salts of fissile isotopes to the tubes is achieved by any one or more of natural convection of the molten salts, mechanical stirring of the molten salts, and oscillating fuel salt flow within the tubes. The molten salts of fissile isotopes are contained entirely within the tubes during operation of the reactor.

License terms will be disclosed post NDA.

Patent or application number	Priority date	Description
PCT/GB2014/050481	2/25/13	Master patent governing basic concept of using molten salt fuel in simple fuel assemblies instead of a complex pumped system
PCT/GB2015/050485	3/20/14	Control of molten salt corrosion and iodine release
PCT/GB2015/050673	10/12/14	Reversible poisoning of molten salt coolant as emergency control mechanism
PCT/EP2021/074175	9/9/20	Passive nuclear reactivity control device giving strong negative reactivity coefficient
PCT/GB2017/050684	3/16/16	Industrially practical pyro process for producing SSR fuel from spent uranium oxide fuel
GB1801783.0	2/3/18	Continuous pyro process for producing SSR fuel from spent uranium oxide fuel
GB2007517.2	5/20/20	Control of noble gas bubble formation in a molten salt reactor
GB2014090.1	9/8/20	Heat exchanger

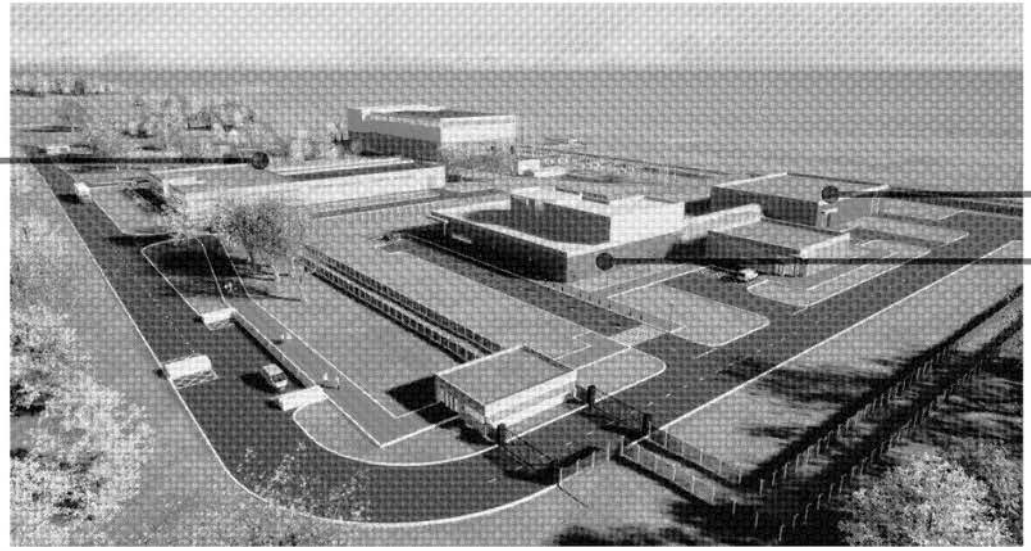
Combined product offering

Moltex is seeking to accelerate its first mover advantage in solving one of the world's most financially rewarding challenges: safe, low-cost, flexible, baseload, zero-carbon, electric power, using spent nuclear fuel.

Along with WATSS spent fuel recycling and the SSR-W reactor, Moltex's technology package includes GridReserve® thermal energy storage for peaking power to support intermittent renewables, or clean hydrogen production.

GridReserve

A series of tanks used to store thermal energy from the reactor and dispatch it to the grid when needed.



WATSS
(WAste To Stable Salt)

A facility in which nuclear waste is recycled to produce fuel suitable for a fast reactor.

SSR-W
(Stable Salt Reactor - Wasteburner)

A fast neutron 300-500 MW reactor that uses recycled nuclear waste as fuel.

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Management

Rory O'Sullivan, CEO

Joined Moltex in 2015 at inception as Chief Operations Officer, CEO since 2018. Previously with Bouygues (U.K.) where his last position was Site/Project Manager.

John Mauti, CFO

Joined Moltex as Chief Financial Officer in 2023. Previously with Ontario Power Generation, where he was CFO and SVP, Finance.

Tristan Jackson, VP Corporate Development

Joined Moltex in June 2022 as VP Corporate Development. Previously Chief Strategy Officer & Co-Founder at VECKTA, Global Director of Smart & Distributed Energy at Worley, VP at Dialogos, co-founder of UpGrid (acquired).

Erin Polka, VP Communications

Joined Moltex in May 2020 and is responsible for strategic communications, media relations and stakeholder management. Previously with the Canadian Nuclear Association.

Robert Mallozzi, Technical Director

Joined Moltex in January 2023. Previously at Candu Energy and AECL. 20+ years managing international/domestic power projects.

Directors

José Emeterio Gutiérrez

Chair | CEO, Westinghouse (retired)

Ian Scott

Co-founder, Director

Rory O'Sullivan

CEO, Director

Xabier Ruiz

Non-Exec Director | COO, IDOM

John Mauti

Non-Exec Director | CFO, OPG (retired)

Joe St. Julian

Non-Exec Director | President, Nuclear, AtkinsRealis

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Innovation, Science and Economic Development Canada / Innovation, Sciences et Développement économique Canada

Security Classification	Protected B
CCM Number	BN0017277
Lead Sector	ICS-SIF
Sector Consulted	IS-AMISB
Contact	Denis Martel, SIF-OPS, 613-286-2990
Originator	James Campbell, SIF-OPS
Action Required	For information

Advice to the Minister of Innovation, Science and Industry

Update on a Strategic Innovation Fund Contribution Agreement

Summary

- Moltex Energy Canada (Moltex) is requesting [redacted]
- The SIF agreement with Moltex is a $47.5 million repayable contribution towards a $95 million project, [redacted] The project started in October 2020 and is currently set to end in March 2025. To date, SIF has [redacted]
- [redacted]

Background

Headquartered in Saint John, New Brunswick, Moltex Energy Canada Inc. was incorporated in 2017 and [redacted] The company is developing a suite of nuclear technologies to provide low-cost clean energy.

This includes a Waste to Stable Salts (WATSS) conversion process and a Stable Salt Reactor – Wasteburner (SSR-W) small modular reactor (SMR) to create a clean-energy system for the development of power production technologies and reduction of used nuclear fuel stocks.

Moltex's long-term vision is to build a commercial demonstration of its SMR using recycled CANDU fuel rods through its WATSS conversion process,

In October 2020, SIF approved a $47.5 million contribution, to support the development and commercialization of Moltex's technologies and in the interests of supporting economic and environmental benefits for Atlantic Canada.

Although Moltex has recently reached an agreement with the North Shore Mi'kmaq District Council (NSMTC) and its member communities for

Considerations

Currently,

[redacted]

Next Steps

[redacted]

The department will continue to work with Moltex and other stakeholders to support the project within the parameters of the current agreement.

Bilodeau, Francis

Digitally signed by Bilodeau, Francis
Date: 2023.11.14 21:11:07 -05'00'

Simon Kennedy
Deputy Minister

Attachment:

Annex A: Moltex Energy Canada Executive Team

CCM BN0017727

A

ANNEX A

Moltex Energy Canada Executive Team

Executive Team Members

- Rory O'Sullivan, Chief Executive Officer
- John Mauti, Chief Financial Officer

Strategic Innovation Fund Company Update:

Total Eligible Project Cost:
Requested SIF Contribution:
Application Stage:
Updated:

Project Summary:

Status:

Next Steps:

Company Background:

Key Considerations:

Project Details

s.20(1)(b)

s.20(1)(c)

s.21(1)(a)

s.21(1)(b)

s.69(1)(g) re (e)

[redacted]

Past Commitments:

[redacted]

Engagements:

[redacted]

Innovation, Science and Economic Development Canada | Innovation, Sciences et Développement économique Canada

IS + SIF ADM Touchbase

Annotated Agenda for A/ADM Lapointe

Date: Wednesday, February 14, 2024 **| Time:** 10:00 AM - 10:30 AM EST **| Location:** MS Teams

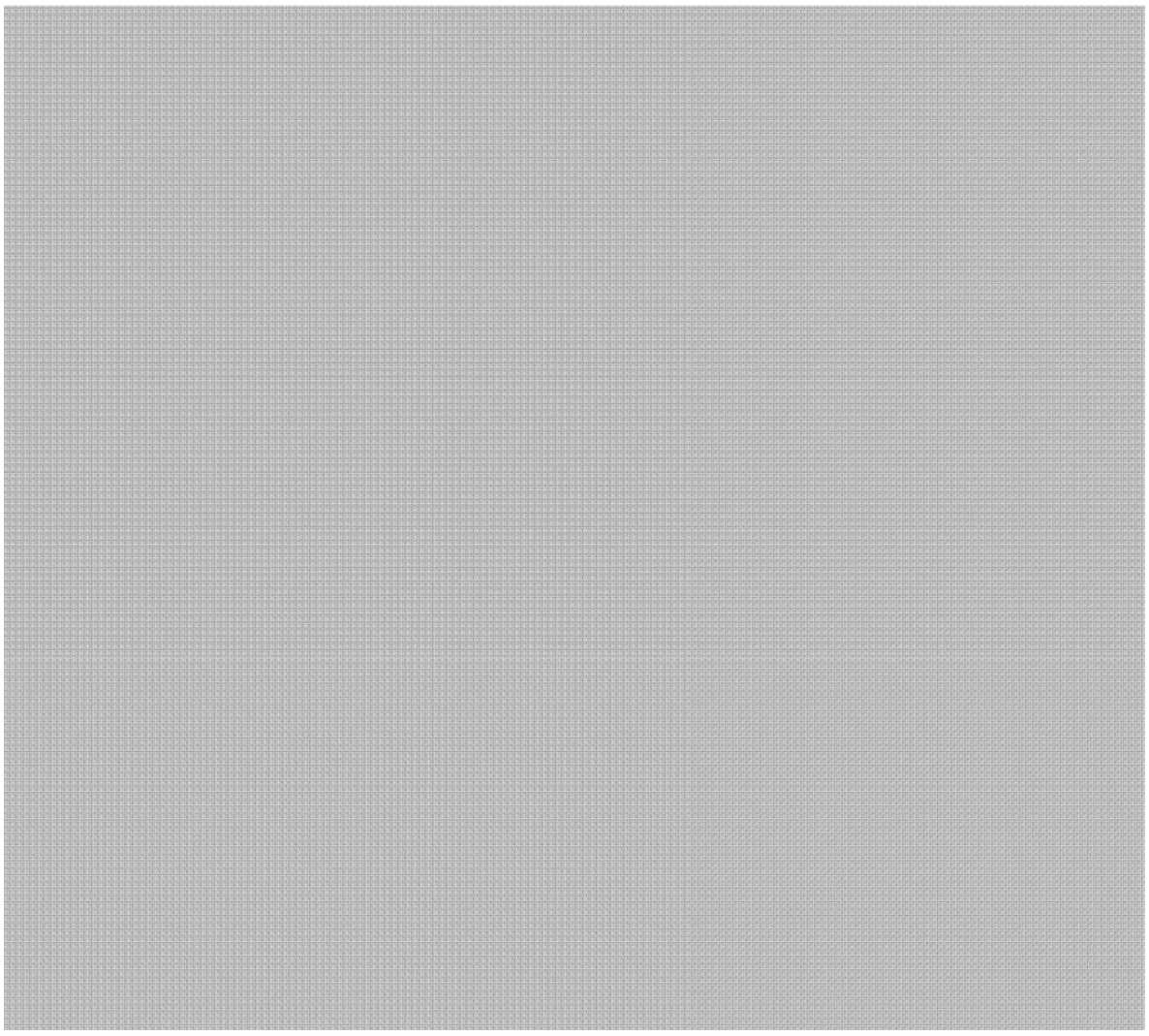
Attendees:
Charles Vincent, A/Senior Assistant Deputy Minister, Industry Sector, ISED
Mary Gregory, Associate Assistant Deputy Minister, Industry Sector, ISED
Jean-Philippe Lapointe, A/Assistant Deputy Minister, Innovation Canada, ISED

The purpose of this meeting is to allow discussions in order to align with projects or other relevant issues with IS, i.e., stakeholder management, rejection, etc.

Seeking agenda proposals, including speaking notes for A/ADM Lapointe (max 2-3 bullets)

Please note A/ADM Lapointe should be previously briefed on your agenda proposal. Otherwise, please provide a more detailed background. For reference only, the **previous** annotated agenda is linked here

Business Development and Strategies:



[redacted]

Operations / Collaborations and Networks:

CAN :

- Would it be possible to see if we had any updates on [redacted]

OPS :

- **Terrestrial Energy:** [redacted]

Financial Analysis and Oversight:

- NIL

Items To Be Raised By Industry Sector:

- ADMO to add

Confidential

s.20(1)(b) s.69(1)(g) re (a)

s.20(1)(c)

s.21(1)(a)

s.21(1)(b)

Brief – Budget Proposal

[redacted]

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Jan 11, 2023

Federal Government Support Required for Nuclear Waste Recycling Technology

From now (Jan. 2023) to full commercialization, Moltex has a 10-year roadmap of significant investment that requires government intervention to enable private sector investment.

Moltex is the only Canadian SMR technology being developed with a utility. It is currently the only opportunity the federal government has of ensuring there is at least one fully Canadian SMR.

The Moltex technology will be the world's first reactor to fully recycle nuclear waste.

Moltex will also help Canada and the world affordably, safely decarbonize.

Support

Necessary federal support falls into four areas:

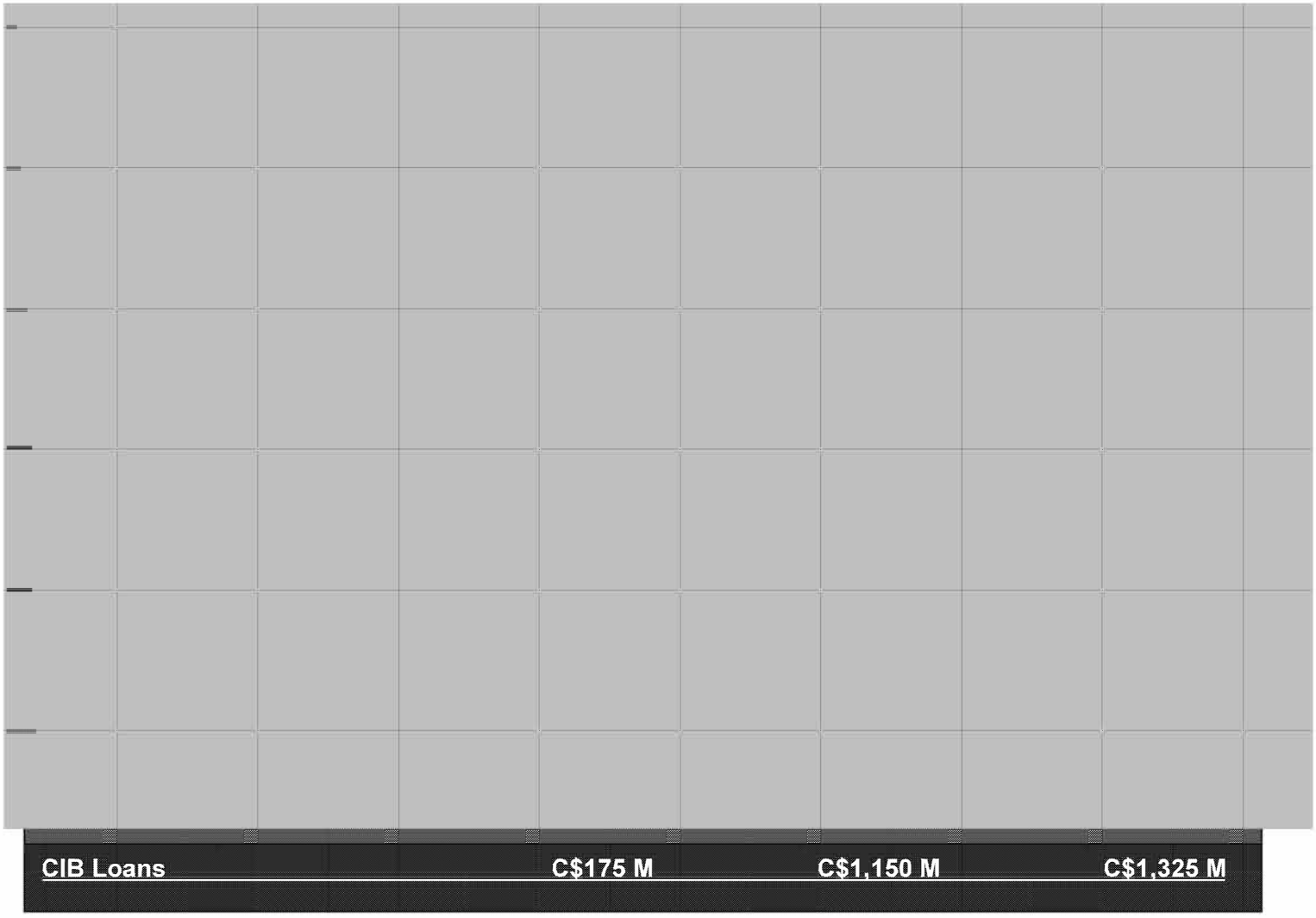
1. De-risking of technology development financing:
    a. 50% cost share for technology development, currently estimated at $210M, see table below.
    b. CIB loans to owner to cover significant portion of Project costs (construction + Pre-construction) to reduce electricity costs.
    c. Providing a backstop on project cost overruns for the first unit to enable private investment.
2. Streamline the regulatory process:
    a. The current Impact Assessment process is not compatible with decarbonisation timelines. For the entire nuclear sector, the IA must be restructured to ≤ 3 yrs.
3. Fuel security & waste policy: Moltex, unlike other reactors, does not use fresh uranium.
    a. Ensure that additional waste costs for first units are borne by the federal government until a fleet is deployed and costs can be spread over multiple units.
    b. Ensure a policy to enable spent fuel recycling is in place.
4. Incentives to match or surpass international competitors: To counteract "brain drain."
    a. A one-to-one copy of the IRA would be a great starting point, however, to command a leadership role we believe Canada must be more aggressive: Include nuclear in Green Bond taxonomies, provide 'payment in lieu' alternatives to the Investment Tax Credits (ITCs), provide loan guarantees, low interest loans, and grants, extend the ITC eligibility period for nuclear to at least 2040, make nuclear eligible for the Accelerated Capital Cost Allowance and an extended Accelerated Investment Incentive, and The Clean Fuel Manufacturing Tax Credit. These points have been raised by the CNA.

s.20(1)(b)

s.20(1)(c)

CONFIDENTIAL & COMMERCIALLY SENSITIVE

Jan 11, 2023



CIB Loans	C$175 M	C$1,150 M	C$1,325 M

Background

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 used fuel from other reactors, greatly reducing nuclear waste.

Canada is committed to decarbonizing, and experts agree, "there is no net zero without nuclear." Canada is also a nuclear energy leader, and can capitalize on growth in the sector. In this pivotal moment, Canada has 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 lock in the 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. Moltex is excited to help and looks forward to deep collaboration.

From:	Vanderschot,Julie (elle, la | she, her) (ECCC)
To:	Mitrovic2, Milenka (ISED/ISDE)
Cc:	Weber2, Christian (ISED/ISDE); Larwill, Mackenzie;
Subject:	FW: Urgent - Clean Growth project list input by COB on Oct. 16, 2023
Attachments:	Potential early action and watchlist - Oct 6 pm - WORKING DRAFT .xlsx
Sent:	2023-10-13 3:13:37 PM

Hi Milenka,
Per our discussion. The projects in the "Early Action" tab are what we have been asked to review.
Julie

From: Ponsford,Catherine (elle, la | she, her) (ECCC) <Catherine.Ponsford@ec.gc.ca>
Sent: Friday, October 13, 2023 2:14 PM
To: Vanderschot,Julie (elle, la | she, her) (ECCC) <Julie.Vanderschot@ec.gc.ca>
Subject: RE: Urgent - Clean Growth project list input by COB on Oct. 16, 2023
Julie,
Does this do the trick?
CP

From: Vanderschot,Julie (elle, la | she, her) (ECCC) <Julie.Vanderschot@ec.gc.ca>
Sent: Friday, October 13, 2023 11:01 AM
To: Ponsford,Catherine (elle, la | she, her) (ECCC) <Catherine.Ponsford@ec.gc.ca>
Cc: Lefebvre,Marie-Pierre (elle, la | she, her) (ECCC) <MariePierre.Lefebvre@ec.gc.ca>
Subject: RE: Urgent - Clean Growth project list input by COB on Oct. 16, 2023
Hi Catherine,
Our team in Programs Directorate is working with CCB colleagues to provide input for your Monday deadline. I will also be connecting with our colleagues at ISED to confirm the status of the

; and checking to see if the

Would you be able to share with me the current list from PCO (and not our ECCC working version) so that I could flip it to ISED colleagues?
Thanks,
Julie

From: Ponsford,Catherine (elle, la | she, her) (ECCC) <Catherine.Ponsford@ec.gc.ca>
Sent: Thursday, October 12, 2023 4:08 PM
To: Vermette,Richard (il, lui | he, him) (ECCC) <Richard.Vermette@ec.gc.ca>; Jutzi,Daniel (il, le, lui | he, him, his) (ECCC) <Daniel.Jutzi@ec.gc.ca>; Lefebvre,Marie-Pierre (elle, la | she, her) (ECCC) <MariePierre.Lefebvre@ec.gc.ca>; Vanderschot,Julie (elle, la | she, her) (ECCC) <Julie.Vanderschot@ec.gc.ca>; DeBruyn,Jennifer (ECCC) <Jennifer.DeBruyn@ec.gc.ca>; Walker,Hayden (ECCC) <Hayden.Walker@ec.gc.ca>; Brophy,Mike (ECCC) <Mike.Brophy@ec.gc.ca>; OBrien,Ashley (elle, la | she, her) (ECCC) <Ashley.OBrien@ec.gc.ca>; Lamirande,Iannick (il, lui | he, him) (ECCC) <Iannick.Lamirande@ec.gc.ca>; Bowerman,Michelle (elle, la | she, her) (ECCC) <Michelle.Bowerman@ec.gc.ca>
Subject: Urgent - Clean Growth project list input by COB on Oct. 16, 2023

Hello colleagues,
I am writing to seek your input to a list of Clean Growth Projects developed by PCO – we have been asked to provide this input by Monday or Tuesday of next week (Oct. 16 or 17) please provide your input by COB Oct. 16.
Please coordinate within your branches how best to provide your input.

Thank you for your cooperation.

Catherine Ponsford
(she, her, elle)
Program Integration, Environmental Evaluation
Environment and Climate Change Canada / Government of Canada
Catherine.ponsford@ec.gc.ca / Cell: 604-369-3924
L'intégration du programme, Évaluation environnementale
Environnement et Changement climatique Canada/ Gouvernement du Canada
catherine.ponsford@ec.gc.ca / Tél cell. : 604-369-3924