Moltex reactor and recycling technology

Technology-specific areas for research and development

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Moltex progress

2014

- Company founded and master patent granted

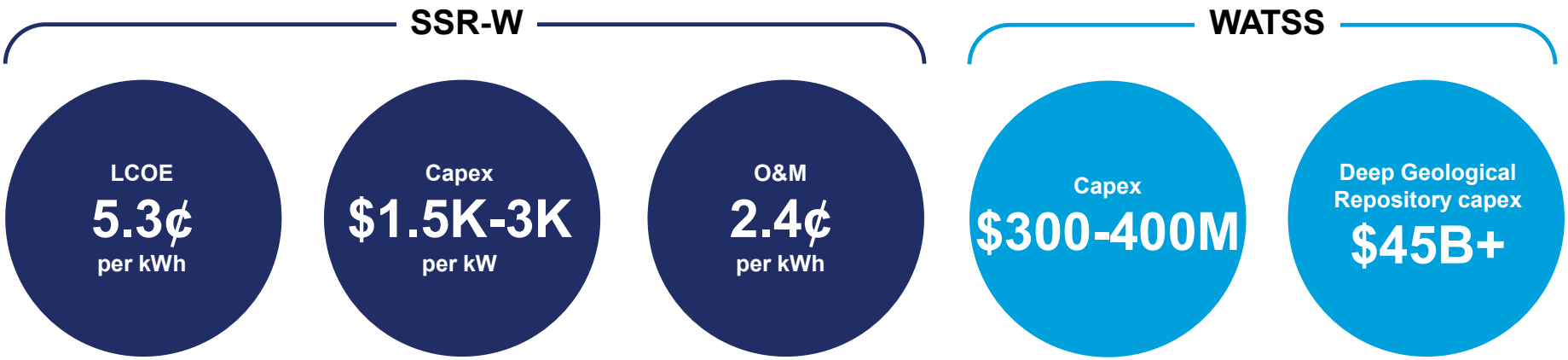
2018

- Established office in Saint John, New Brunswick

2019-2022

- Expanded team to focus on design, R&D, supply chain and stakeholder engagement
- Major investments from established nuclear companies; first nuclear crowdfunding
- Received ~U$40M from Canadian gov't; ~U$800K from Ontario Power Generation
- Formed strategic partnership with SNC-Lavalin
- Completed Canadian Nuclear Safety Commission Vendor Design Review Phase 1

Ultra-competitive economics*



- Business case for waste reduction and low-cost electricity are distinct and compelling
- WATSS economics varies with capacity and location but has big margins

*All figures in USD.

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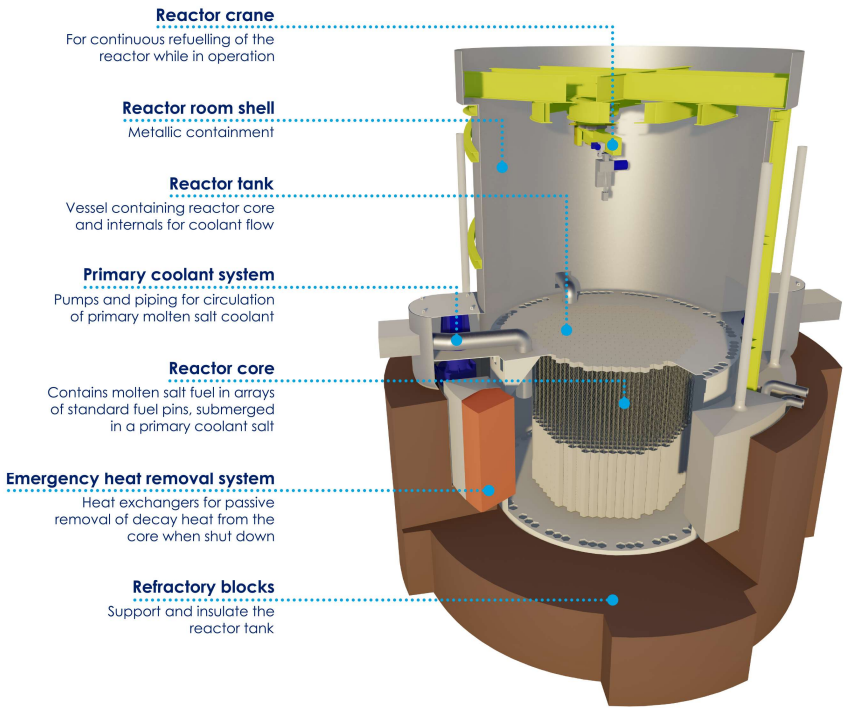
Technology (re)introduction

Stable Salt Reactor – Wasteburner (SSR-W) overview

- Fast neutron spectrum MSR
- 300-500 MWe per unit
- Fresh SSR-W fuel from spent nuclear fuel
- Molten fuel salt is inside fuel pins in fuel assemblies
- Fission products either gas off or dissolve in fuel salt
- Emergency heat removal is via tank wall
- Continual online refuelling



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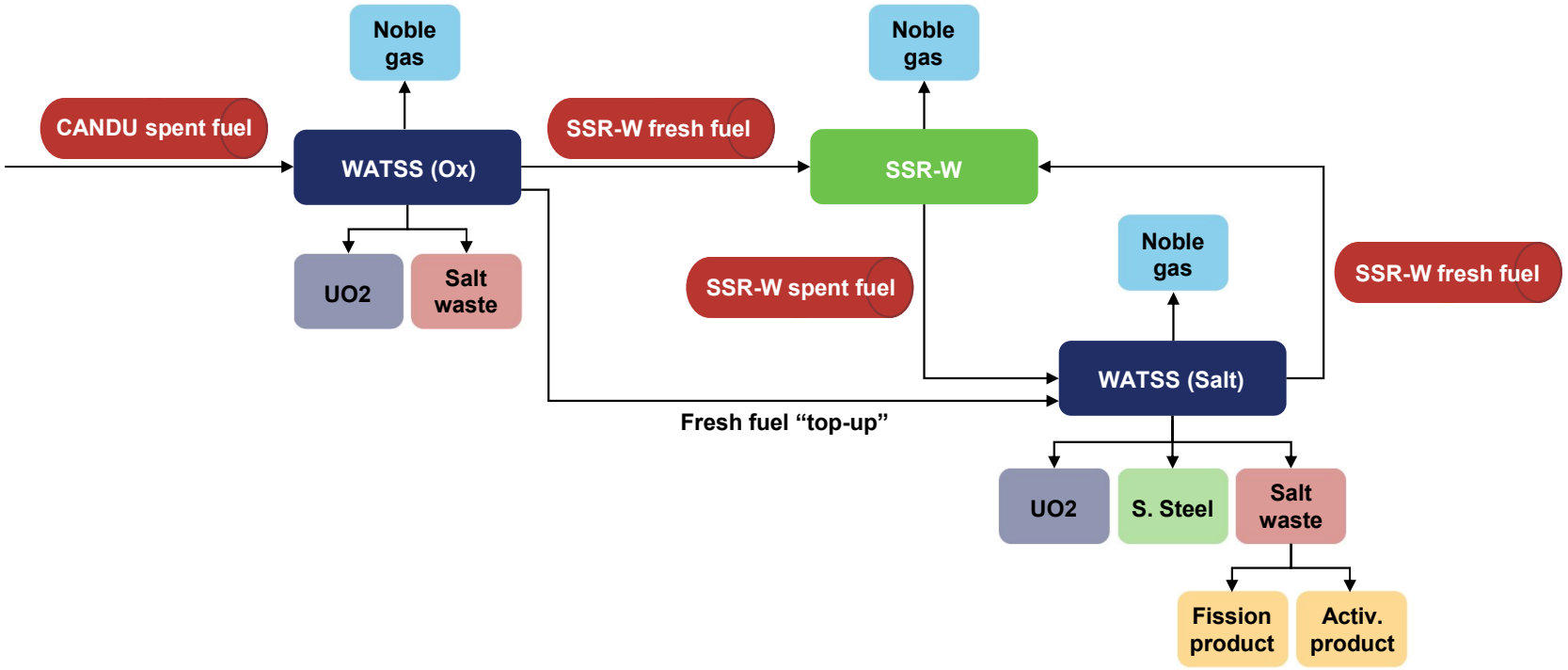
WAste To Stable Salt (WATSS) - overview of "local" fuel cycle



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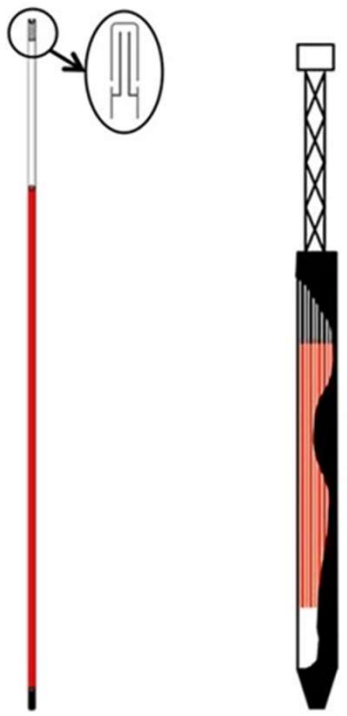
SSR-W specific areas of interest

Specific needs arising from unique design aspects

- Thermal expansion of the fuel salt drives negative reactivity coefficient
    - Salt thermophysical properties (wrt irradiation, fission/activation product build up)
- Heat transfer path is fuel salt to pin clad to coolant salt
    - Direct measurement of, and model validation of heat transfer coefficients (wrt irradiation, fission/activation product build up)
- Behaviour of offgassing in the bulk and the bubbler influences negative reactivity insertion and gas release to reactor tank
    - Salt thermochemical properties and the modelling of the bubbler

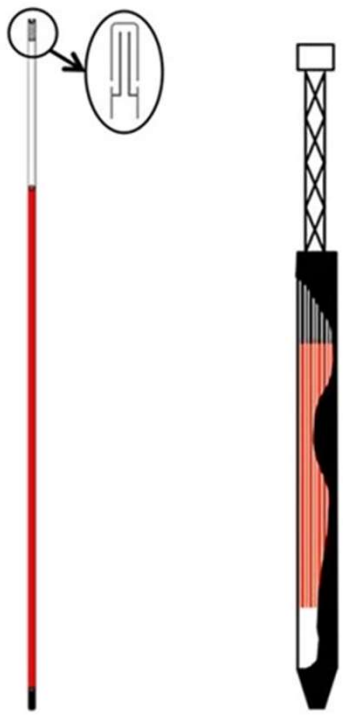
Aim to both directly acquire



Single fuel tube and assembly

Specific needs arising from unique design aspects

- The operating conditions that the fuel assembly metal encounters are characterized by:
  - High flux and temperatures (not unprecedented)
  - Molten salts with relatively high FP/AP
  - Fast fission product (ions) irradiation of metal and salt
  - Radiation driven formation of intermetallics (?)
  - Temporary decoupling from redox (?)



Single fuel tube and assembly

Expectation

Moltex Design and Safety Analysis process will identify the data and operating conditions needed to claim capability, reliability and robustness of components and systems.

Moltex R&D will engage primarily the Canadian supply chain to help:

a) Determine an informed consensus on the relevant testing conditions

b) Use lessons learned from licensing of novel technology in CANDU or related nuc tech

c) Execute the work

However, in addition to Moltex-driven work, we believe there is a need for alternative, independent source of consensus on the adequacy and comprehensiveness of our data.

Thank you

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