

# Small Modular Reactors



# We embrace your vision as our own

There is growing international interest in the development of small nuclear reactor (SMR) technology. Some of the drivers are geographical. Small, remote, or isolated locations where access to grid infrastructure is challenged may still require reliable electricity.

Communities and industries where electrical grids are smaller, poorly developed, or absent need support. Essential services must be ensured and provided where non-electrical products, such as heat or desalinated water, are as important as the electricity that powers their delivery.

Others, like utilities, are driven by economics. Per unit, the upfront capital cost of an SMR is significantly lower than other power alternatives. SMRs are more flexible and easily customized, so that capacity can be increased by adding modules incrementally as needed. This means smaller financial risks, making SMRs attractive to investors and countries initiating a nuclear program, as well as for use in industrial infrastructure applications.

Our reactor development team at Hatch has been assessing technical and commercial feasibility studies for advanced nuclear reactors. Our extensive experience in nuclear technology and access to resources in infrastructure, project management, construction management, and consulting provide practical solutions that are safe, innovative, and sustainable.

Hatch's in-depth knowledge of mining, metals, heavy industry, and nuclear power put us in a unique position with respect to SMRs. We know how to develop new technology and

make it commercially viable, and we've done the homework to define and demonstrate the real benefits this technology can offer. The benefits of Hatch's experience with this first-in-kind technology helps our clients realize their dreams.

We can help SMR developers with:

- SMR plant BOP design
- novel fuel-fabrication facility design and construction
- systems and components-testing facilities and mock-up design and construction
- regulatory and licensing support
- user requirement identification and assessment

We can provide utility or end-user clients with:

- technology due diligence
- site security design and implementation
- SMR integration with micro-grid/industrial facilities
- logistics and procurement
- environmental assessment and site evaluation

We can assist SMR investors with:

- technology due diligence
- market survey and business case evaluation



SMRs are being studied as a suitable power option for remote sites that need access to reliable electricity

# Hatch's SMR experience

## Survey of design and regulatory requirements for new small reactors

Our team of experts assessed seven SMR technologies for the Canadian Nuclear Safety Commission to identify design innovations and their safety features to support Canadian regulations. In addition to the technical assessment, we also examined the regulatory aspects of SMR licensing in Canada and performed a gap analysis of existing regulations.

## SMR transportation study

For an SMR developer, Hatch evaluated the technical feasibility of transporting an SMR to a remote mining operation where our client considered the transportation of a 10-MWe, gas-cooled reactor to the deployment site. The study examined the technical and regulatory challenges associated with transporting a loaded nuclear reactor in Northern Canada.

## System sizing review

For another SMR developer, the nuclear power system was compared to reciprocating-engine power plant configurations, which are currently the most common technologies for servicing mine operations with electrical loads of less than 100 MW. Hatch analyzed the electrical power and thermal-energy-generation design capacities of the SMR in relation to the energy consumption of existing and future remote Canadian mining operations.

## SMRs for off-grid mines

In this study for the Ontario Ministry of Energy and Natural Resources Canada, Hatch performed a business and technology assessment of SMRs to provide power and heat to remote industrial locations. The following assessments were completed: drivers for SMR development; market potential, including communities and mining operations in Northern Canada; benefits of SMRs in mining operations, including the financial impacts; technology considerations specific to nuclear power applications in mining; business models; challenges and risks assessments; and identification of technologies currently under development.

## Supply of safe, sustainable and cost-effective energy via molten salt reactors

Hatch performed a series of technical and business feasibility studies of generation IV (Gen IV) nuclear reactor technologies with a focus on molten salt reactor technology. Several assessment reports were produced, which included: a power maneuvering capability study; a process heat application; a nuclear-waste-production-rate analysis; a radiotoxic inventory of nuclear waste based on various fuel cycle scenarios; and Gen IV technologies.



# About Hatch

Whatever our clients envision, our engineers can design and build. With over six decades of business and technical experience in the mining, energy, and infrastructure sectors, we know your business and understand that your challenges are changing rapidly.

We respond quickly with solutions that are smarter, more efficient, and innovative. We draw upon our 9,000 staff with experience in over 150 countries to challenge the status quo and create positive change for our clients, our employees, and the communities we serve.

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