

+ Nuclear

HATCH



Building our energy future

Supporting the nuclear lifecycle with meeting ever expanding current and future demand

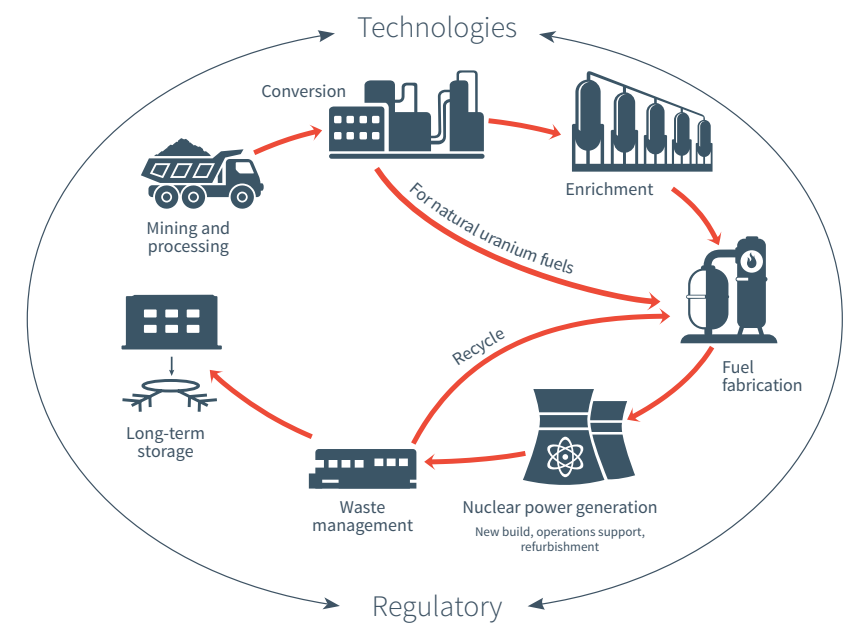
Nuclear is an essential part of the energy mix required to meet surging global demands for power.

Nuclear energy provides clean and accessible power, offering a reliable source of baseload energy, while providing stability to a power grid that is faced with unprecedented challenges. The commitment to expand nuclear power is growing, and the next generation of reactor designs are on the brink of commercialization, unlocking new

market opportunities. Innovative approaches to life extension are supporting continued operation, providing more out of the existing nuclear fleet. Fusion development is also surging forward, with aims to put power on the grid in the next decade. With nuclear, the possibilities are endless for our future.

Big. Small. New. Refurbished. Whatever your plans, whatever your scope, whatever your technology.

We can help.



+ Essential services, sound strategies

Nuclear energy represents sustainable and accessible power. Offering a reliable and emissions-free source of baseload energy, while providing stability to a power distribution grid that is faced with unprecedented challenges.

Small modular reactors

We've been involved in supporting the development and evaluation of Small Modular Reactors (SMRs) as a flexible, greenhouse-gas-emission-free source of on-grid or off-grid power since 2012. SMRs are a class of nuclear reactors designed to be built-in modules, with each module producing less power than a conventional nuclear power plant unit. SMRs can also provide heat for heavy industry, provide efficiencies to existing operations that traditional nuclear reactors are not well suited for and enabling new synergies between industries. As we seek to tackle climate change and create a carbon-free energy future, we're working with SMR vendors, utilities, heavy industry, industry regulators, and governments to support their development, licensing, and implementation.

Nuclear new builds and refurbishments

By any standard, nuclear projects are mega projects. They're expensive, important, and technically complex. Bringing together the technical expertise and financial resources to execute these projects requires the use of novel financing methods in order to guarantee a healthy return on investment and appropriate risk sharing.

We have a long history of project execution excellence across all sectors and around the world. Our Front-End Loading project lifecycle process ensures that each project is rigorously defined – and challenged – before progressing into execution.

- Conceptual and Preliminary engineering phases are used to identify and optimize a preferred concept into a fully defined and strategically planned facility. Progressing through to a comprehensive basic engineering package, our engineers and

project managers supported by all of our delivery and business practices develop a full project implementation plan, including procurement strategies, construction sequencing, and risk management, together with a control-level cost estimate and schedule to ensure the project is positioned for predictable performance as it moves into execution.

- The execution phase works the plan. The project schedule sequences detailed design activities to support procurement and construction timelines to keep the project on track. With today's digital engineering and delivery infrastructure, progress can be accurately tracked, and changes efficiently managed to keep progress moving. Integration of commissioning and turnover activities as the facility reaches physical completion ensures a smooth transition to operations.

We have fresh ideas and concepts from our experience across the power industry, and other industries in which we work, that we leverage to bring more cost and schedule certainty. Combining our execution expertise with our specialists in fire protection, seismic design, physical and cyber security, and radiation safety, and other disciplines, we bring our clients solutions that benefit from our extensive experience across the new build and refurbishment industry.

Fusion

Fusion represents a source of carbon-free and accessible power for all. Its power is clean, available on demand, and generates minimal radioactive waste. As new and innovative advancements continue, fusion projects around the world are working to move from laboratories to the grid.

We were founded as a technology development organization—at the core, we're innovators, always looking for new solutions. You need an experienced partner who can adapt quickly amid the volatility of technology development while meeting project execution goals. One that offers an efficient delivery model, tailored to allow each project partner to focus on what they do best. We are experienced in helping fusion technology developers with the design and construction of supporting systems.



Nuclear waste management and long-term storage

The nuclear industry has sound, stringent processes, and facilities to manage nuclear by-products. We've assisted organizations like yours with tools and methods to handle nuclear waste and deal with issues relating to the storage of used fuel. We understand the pivotal role that waste management and storage plays in the success of the nuclear industry, and the need for solid research and robust processes to safely store and manage nuclear waste.

Regulatory requirements, codes, and standards

The world's nuclear regulatory environment is complex—and for good reason. Nuclear power technology is intricate and powerful and must be managed carefully. Understanding and respecting regulatory environments and expectations are paramount.

Hatch has expertise and experience both in working and interfacing with a number of regulatory authorities. We support our clients with regulatory submittals not only to nuclear regulators, but also to local authorities responsible for environmental and planning permissions. Our specialists are well respected across the industry with many professionals contributing to technical, regulatory, and standards oversight committees and groups.

Operations support

Managing obsolescence issues and minimizing outage durations and impacts is just the beginning. Finding better, more efficient ways to handle ongoing operations can improve processes, increase production, cut costs, and enhance your bottom line.

Our comprehensive approach considers financial value and regulatory compliance to help you develop and implement a strategy that maximizes asset value while minimizing risk. This can include conducting performance evaluations to measure the effectiveness of existing asset management plans and identifying opportunities for improvement, developing contingency plans and risk mitigation strategies, and supporting asset investment planning and prioritization through data driven decision tools.

Whether you're ramping up projects, quantifying risks, prioritizing tasks, or optimizing assets, we have experienced professionals and expert services to help you. Every solution is tailored to your specific operating issues, across the full business life cycle, from concept to closure.

Research and technology development

Your organization contributes to the worldwide nuclear industry, developing and sharing new technologies, and best practices. In our work with utilities, regulators, and industry associations, we have made substantial contributions to the body of knowledge and operating experience of our clients.

We help to solve our client's toughest challenges. From bespoke designs to first-of-a-kind deployments, we've seen it all:

- Supporting first-of-a-kind small modular reactor development
- Designing test loops in support of fusion and fission commercialization
- Developing custom tooling to support challenging operation, maintenance and decommissioning activities
- Progressing commercialization of novel technologies for radioactive waste decontamination

We have the experience and know-how to support you in your research, development, and commercialization efforts. Our research and technology development experience inside our nuclear businesses and across our business portfolio is one of our key differentiators.

Uranium fuel cycle

With the current and future growth of nuclear energy, the demand for uranium is forecast to increase significantly. This presents an opportunity not only for mining companies to capitalize on the potential for increased demand, but also for companies involved in conversion, enrichment, and fuel fabrication to benefit.

Hatch has direct project execution experience in uranium mining and our experts have in-depth knowledge and global experience in uranium processing, including refining, conversion, and nuclear fuel fabrication. Wherever your project sits in the uranium fuel cycle, we have the expertise to support your success.

+ Selected project experience

Engineering North America's first advanced small modular nuclear reactor X-energy LLC, USA

Under the US Department of Energy's Advanced Reactor Demonstration Program (ARDP), X-energy and Dow are spearheading a ground-breaking initiative to deploy North America's first advanced small modular nuclear reactor (SMR) at an industrial site. This pioneering project is not just a leap forward in nuclear energy solutions but also a significant stride towards broad decarbonization efforts.

We are proud to provide engineering and project management support, playing a crucial role in advancing this innovative solution. Our approach harnesses our extensive expertise in project delivery, technology development, and nuclear and power conversion. This will create a reliable, carbon-free energy source capable of generating 200 MW of thermal power, which translates to up to 80 MW of electrical generation for both power and heat applications. This project stands as a beacon of SMR technology, showcasing the potential of nuclear energy to drive sustainable industrial growth and environmental stewardship.

Advancing the future of nuclear science in Canada

Canadian Nuclear Laboratories, Canada

The Canadian Nuclear Laboratories (CNL) Program is a transformative initiative aimed at revitalizing the Chalk River Laboratories campus and advancing nuclear science and technology in Canada. This ambitious project focuses on modernizing facilities, enhancing research capabilities, and driving innovation in nuclear technology. We are a key partner in this project, providing critical engineering and project management support. By leveraging our extensive expertise, we are helping to enhance CNL's capabilities, ensuring the successful delivery of innovative nuclear solutions. This collaboration not only supports CNL's Vision 2030 but also contributes to broader sustainability goals and economic development through local and Indigenous engagement. Together, we are paving the way for a sustainable and technologically advanced future in the nuclear sector.

Ensuring a stable and secure energy supply with nuclear

Ontario Power Generation, Canada

In Ontario, an ambitious initiative launched in 2012 has seen over 150 projects undertaken at the Darlington and Pickering nuclear generating stations. These projects, ranging from minor modifications to massive infrastructure refurbishments, have significantly enhanced the efficiency and reliability of these facilities. Our involvement, with over 250 staff members contributing more than 1 million person-hours, has been crucial in supporting Ontario Power Generation's systems and operations. We provided essential engineering and design services, ensuring the successful execution of these complex projects.

The benefits of these projects are substantial, ensuring a stable and secure energy supply for the region. By modernizing critical infrastructure, we are paving the way for a more sustainable and resilient energy future. These advancements not only bolster current energy production but also set a strong foundation for future innovations in nuclear technology, contributing to long-term environmental and economic benefits.

Modern nuclear technology's potential for safe and efficient energy

Westinghouse Electric Company, China and USA

The Westinghouse AP1000™ pressurized water reactor is a cutting-edge 1100-MWe nuclear power plant, renowned for its advanced modular design. This innovative reactor uses 50% fewer valves, 35% fewer safety-grade pumps, and 80% less piping than traditional nuclear plants, making it a model of efficiency and safety. We played a pivotal role in this project, providing essential engineering and design services to develop construction drawings for the containment and auxiliary buildings. Our expertise ensured the seamless integration of structural, piping, and mechanical modules, contributing to the plant's overall reliability and performance. This collaboration highlights the potential of modern nuclear technology to deliver safe, efficient, and sustainable energy solutions for the future.

Enabling safe nuclear waste disposal for generations

Nuclear Waste Management Organization, Canada

The Nuclear Waste Management Organization (NWMO) is spearheading an initiative to ensure the safe, long-term management of Canada's used nuclear fuel. This project involves the construction of deep geological repositories, designed to securely contain and isolate radioactive waste for thousands of years. By selecting the Wabigoon Lake Ojibway Nation and the Township of Ignace as host communities, the NWMO has prioritized both safety and community consent. This initiative not only addresses an urgent environmental challenge but also supports Canada's climate goals by ensuring the sustainable use of nuclear energy. The project is a testament to innovative engineering and collaborative efforts with Indigenous communities. As a result, it promises to bring significant economic benefits and job opportunities to the region. Ultimately, this endeavor exemplifies a commitment to protecting people and the environment for generations to come.



Powering tomorrow through ground-breaking fusion demonstration

General Fusion, UK & Canada

We proudly partnered with General Fusion to develop a cutting-edge Fusion Demonstration Plant (FDP) facility, showcasing their innovative Magnetized Target Fusion technology. Our team provided comprehensive engineering services, from pre-conceptual design to basic engineering, ensuring the seamless integration of process fit-out systems crucial for the machine's development and deployment. Additionally, we delivered pre-conceptual to preliminary engineering for the building and its integration, laying the foundation for this pioneering fusion technology. Together, we are pushing the boundaries of energy innovation and paving the way for a sustainable future.



+ About Hatch

Hatch is a global engineering, project management and construction, and professional services firm. Whatever our clients envision, our professionals can design and build. With over seven decades of business and technical experience in the energy, infrastructure, and mining 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 rely upon our 11,000 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.

hatch.com



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