FUSION
FUEL CYCLES

FFC Engineering Services

Fusion Fuel Cycles Inc. (FFC) is here to serve as your trusted partner on the path to commercial fusion. Our engineering team will leverage decades of hands-on experience to efficiently deliver the outputs you need to advance your projects from concept to deployment. Avoid costly mistakes, ensure the safety of your staff, and accelerate your design and planning phases by working with FFC.

When it comes to tritium facilities – we've been through it all: from benchtop demonstrations to industrial-scale detritiation. FFC also works with a wide range of customers at varying levels of design maturity. Whether you are just entering planning for a new facility, or already operating one, FFC's team can help.

Initial Planning and Pre-Conceptual Phases

The initial planning and pre-conceptual design phases of a project have an enormous impact on the cost, schedule, feasibility, licensability, and ultimate efficacy of a facility.
FFC has the breadth of knowledge required to evaluate a fusion project holistically and establish optimal design strategies through multifaceted evaluations using simplified models and our deep experience. FFC also identifies technical challenges, develops roadmaps to address each of them, and conducts order-of-magnitude analyses of investment costs to explore viable pathways to overall project success within customer requirements.

Customer requirements definition

Preliminary modeling and iteration to inform tradeoffs

Initial technical 'pitfall' identification

Design basis development

Order of magnitude cost/tritium inventory estimating and business case development/assessment

Preliminary and Conceptual Design

- Process Flow Diagrams
- Concept of operations feedback
- Safety and licensing assessments
- Preliminary decommissioning planning
- System performance modeling and simulation
- Design reviews and 'optioneering'

As your vision begins to come into focus, many important facility technology, process, safety, licensing, and operational decisions need to be made. These decisions can all impact one another so it is essential to take a whole-system view as 'optioneering' is performed. FFC's proprietary models and experienced staff can provide keen insights to your team throughout this process.

Detailed Design and Commissioning

Through our flagship projects and industry experience, FFC's talented team of engineers is well-equipped to bring your conceptual design through to a detailed, fully integrated set of system drawings. Our team also has decades of experience commissioning and operating tritium facilities and can help get you up and running.

- Component or full system drawing packages
- System integration
- Procurement and supply chain engagement
- On-site commissioning support

Support for Existing Facilities

Effective management of tritium inventory is essential for efficient facility operations. FFC's team and technologies can help you model or detect tritium throughout your system, install appropriate diagnostic tools, recover and recycle tritium, and recommend equipment swap-outs to improve performance.

- **Facility operations reviews for tritium management, efficiency, process improvements**
- **New technology integration support**
- **Diagnostics**
- **Detailed decommissioning planning**
- **Waste management strategies**
- **Custom tooling development**

OUR TEAM

Dr. Satoshi Konishi
Board member

Prof. Satoshi Konishi co-founded KF in 2019. With a Ph.D. in Engineering from the University of Tokyo, Satoshi brings four decades of expertise in R&D, specializing in fusion technology, advanced nuclear system design, and tritium engineering, including significant contributions to the ITER project. He holds dual roles as Chief Fusioneer, overseeing technology development, strategic planning, and execution, and as CEO, a position he has held since 2023.

Dr. Christian Day
Chief Technology Officer

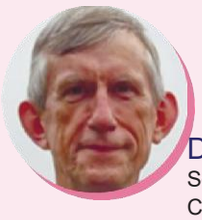
Ph. D. in Process Engineering from University of Karlsruhe, Germany. Nearly three decades at Karlsruhe Institute of Technology, Germany, in all areas of tritium, fueling and vacuum technologies for ITER and other fusion devices. Developed the concept of Direct Internal Recycling to arrive at an attractive reactor scale fuel cycle architecture. Responsible for the EUROfusion fuel cycle program for 10 years prior to joining KF.

Dr. Ian Castillo
Board member,
Co-Chief Executive Officer

Dr. Castillo directs the R&D activities of CNL's Hydrogen and Tritium Directorate, aligning with government stakeholder needs, market trends, and leveraging CNL's extensive hydrogen isotopes expertise both nationally and internationally. With over 17 years in the nuclear industry, he is an expert in hydrogen production, recombination, heavy water and tritium management, chemistry, and process engineering. Dr. Castillo earned his Ph.D. in Chemical Engineering from McGill University.

Dr. Sam Suppiah
Chief Science Officer

Dr. Suppiah, with over 35 years' expertise, drives hydrogen and tritium technology advancements at CNL. Formerly with the British Gas Corporation, he's an expert in Tritium Technologies, Catalysis, and Energy Storage. He's Canada's delegate for the GEN IV VHTR Hydrogen Production Board and a CHFCA board member. A regular at IAEA presentations, he holds a Ph.D. in Chemical Engineering from the University of Birmingham, UK.



Dr. Hugh Boniface
Senior Research Scientist
Canadian Nuclear Laboratories

Hugh boasts 36 years in heavy water and tritium processing facility operations. His expertise spans control and instrumentation, catalyst testing, and process design development. Recently, he's delved into tritium control strategies in lead-lithium-eutectic and molten salt breeder blankets. A notable accomplishment was his leadership in commissioning the Wolsong Tritium Removal Facility. Hugh earned his Ph.D. in Chemical Engineering from the University of New Brunswick.

Yoshifumi Kume
VP of Plant Technology
Kyoto Fusioneering

Yoshifumi specializes in fusion plant process engineering and supply chain management, drives fusion fuel cycle and thermal cycle technology advancements at KF. Formerly with Mitsubishi Corporation, he orchestrated investments and industry-academia partnerships in decarbonizing chemical technology across the European region in London office and led commodity physical and derivative trading in Singapore office.

Dr. Colin Baus
VP of Research and Commercialization
Kyoto Fusioneering

Dr. Todd Whitehorne
Section Head, Tritium Technologies
Canadian Nuclear Laboratories

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Our Website