



SOLUTIONS FOR NUCLEAR INDUSTRY

ABOUT US

To Understand. To Solve. To Deliver.



To Understand

- Partnership approach to building long standing relationships
- Initial enquiry and discovery calls - in person or MS Teams
- Iterative design process from heat balance to detailed design
- Site Surveys

To Solve

- Time-tested design philosophies
- Proprietary and industry research backed design tools
- Dedicated design centre
- AutoCAD Inventor - 3D modelling & manufacturing drawings
- Wide range of heat transfer media - steam, water, thermal oils, exhaust gases & a wide range of liquid, gaseous & vaporious chemicals

To Deliver

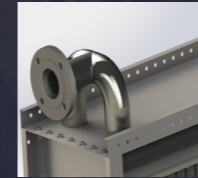
- 60,000 sq. ft factory
- ISO 9000, ISO 14000 & ISO 45001
- Weld procedures to BS EN ISO 15614
- Welders to BS EN ISO 9606



PRODUCTS AND SERVICES

Existing and Emerging

EXISTING RANGE



Design Studies & Collaboration

The breadth and depth of our team's engineering expertise enables us to support our customers, from a broad range of industries, in the conceptualisation, evaluation and implementation of their heat recovery and heat transfer projects.



Heaters for Commercial Applications

Starting from sub-level floor we have discreet Trench Heating, LPHW or electric. Moving up to floor level we offer stylish LPHW Finned Tube Radiators, Floor Standing Trench and a selection of electric Wall Heaters.



Air Coolers & Chillers

Turnbull & Scott provides industrial process cooling and HVAC related cooling solutions for the broadest range of applications including those with requiring ultra-precise sub-ambient air temperature control.



Heat Exchangers

Turnbull & Scott is renowned for the design and manufacture of high end, robust Air Heater coils and batteries which are extensively used in industrial process applications worldwide.



Heat Recovery Solutions

Turnbull and Scott specialise in industrial waste heat recovery equipment, and our thermal energy experts will help you assess your heat recovery project and establish the best solution.

EMERGING RANGE



Thermal Energy Storage

Long Duration Thermal Energy Storage is a global engineering opportunity key to the utilisation of 'curtailed' renewable electricity and the recovery of waste heat. Having already manufactured a lab scale unit for a customer Turnbull & Scott will be building our own first demonstration site in 2024.

Industrial Heat Pumps

Our staff's experience and knowledge of heat pumps, our access to customers seeking to decarbonise operations and our distribution partners strategy makes the inclusion of Industrial Heat Pumps a logical next step.



HEAT EXCHANGER DESIGN AND MANUFACTURE

Tailored to your requirements with precise thermal tolerances, using robust materials and manufacturing techniques honed over 90 years.



Our heat exchanger products are renowned for their reliability and long service life, minimising repair and maintenance costs, as well as downtime and disruption.

We have clients who have used our products for decades and have been able to gain many more years of service through refurbishment, as only high grade materials are utilised.

MODERN AND WELL EQUIPED FACTORY

The main factory is equipped with:

- A main workshop with a 5T Crane over the eight Welding bays fully equipped with welding and ventilation plant and staffed by the company's eight coded welders.
- A CNC Machine shop housing a Punch, Press and Water Jet Cutter.
- A powder coating paint booth, curing oven and wash tank.
- A Gilling shop capable of producing both plate fin and circular finned tubes using two Gill Presses, three lathes and three Rasmusen gilling machines.
- A machine shop containing lathes, drills, and milling machines.

ORC - CHP HEAT TRANSFER SYSTEM FOR AGGREGATES DRYING

With the rising adoption of combined heat and power (CHP) plants by businesses, our client, an aggregate manufacturer, looked to us to optimally utilise 'surplus heat from their ORC-CHP plant.

Initially tasked with designing custom vertical coils and fans to cool a **water/glycol mix from 50°C to 35°C**, our engineering team extended their involvement upon discovering the client's aim to repurpose this heat for a Trommel dryer to dry aggregate.

This project, a first for the client, lacked a complete design for ductwork and necessary pressure calculations. We subsequently took on a comprehensive role, designing and installing the **cooling system, ductwork, and re-specifying fans** to accommodate pressure variations. This holistic approach culminated in the successful delivery and installation of six coils, fans, and ductwork runs, accompanied by a Lifecycle Extension contract to maintain optimal system performance.



SUPPORTING SIMPSONS MALT WITH RENEWABLE ENERGY SOLUTIONS

Turnbull & Scott quickly responded to an enquiry from Simpsons Malt, a long-supported client, to help them meet their 2030 carbon neutrality goal at their Tweed Valley Maltings site.

Our team at the Edinburgh Design Hub performed detailed thermal modelling to engineer **bespoke low-pressure hot water (LPHW) heating coils**.



These innovations are designed to replace traditional gas burners with a system powered by wind energy and biomass, cutting carbon emissions by 80%. Our solution integrates seamlessly into the existing kilning process without compromising the malt drying quality.

We are set to deliver **30 custom-designed LPHW plate-fin air heating coils** by May 2024, significantly contributing to the site's transition to sustainable malting operations, solidifying our role in promoting environmentally conscious industrial practices.

DESIGN COLLABORATION

The breadth and depth of our team's engineering expertise enables us to support our customers, from a broad range of industries, in the conceptualisation, evaluation and implementation of their heat recovery and heat transfer projects.

In addition to our expertise in thermodynamics, fluid dynamics, heat and mass transfer, our customers value our team's approachability, engaging communication style and candour.

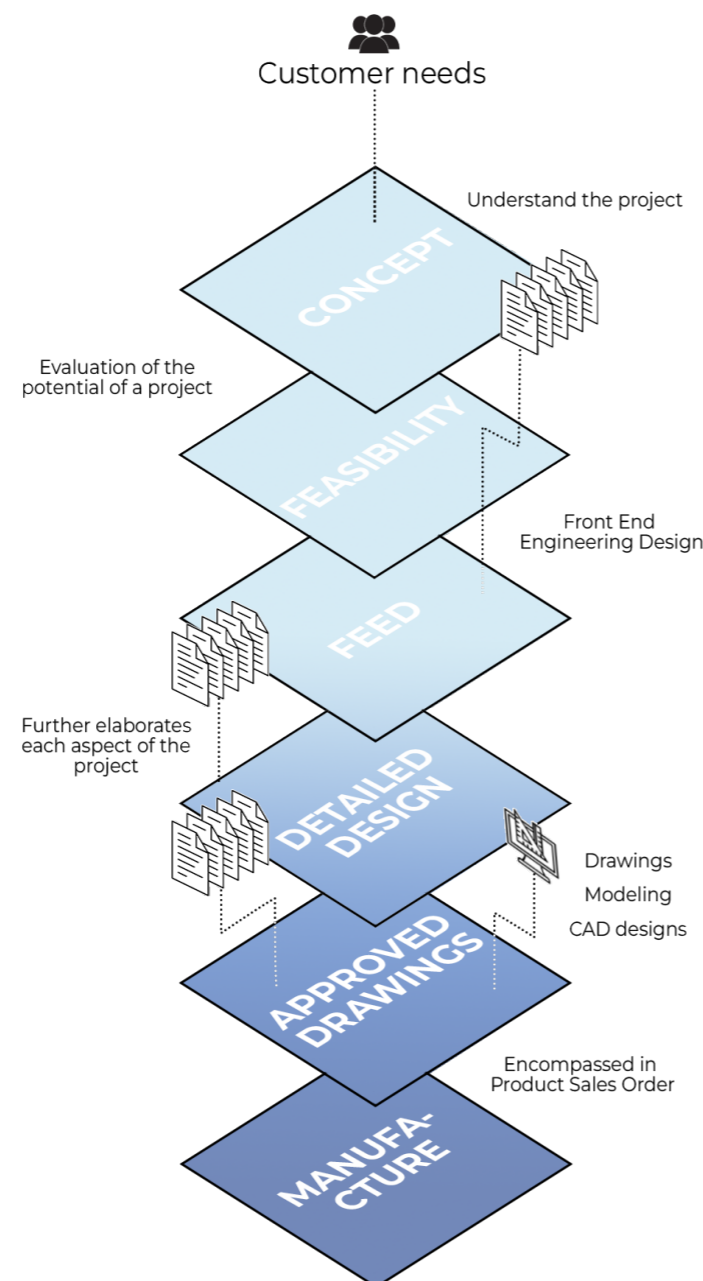
Design Projects typically progress through the following phases:

- **Concept**
- **Feasibility**
- **Front End Engineering Design (FEED)**
- **Detailed Design**
- **Final/As Built Design**

Customers usually have a clear idea of what they are trying to achieve, and so T&S tend to support the Feasibility, FEED and Detailed Design phases as distinct projects. The Final Design phase is an integral part of the manufacturing process and so is normally encompassed in the Product Sales Order. We typically supply, but are not limited to, three types of design services:

EDINBURGH DESIGN HUB

Our Edinburgh Design Hub, in conjunction with our main manufacturing site in Hawick, operates in a seamless and collaborative manner. This ensures a cohesive and integrated approach from design to production. Such a synergy between our design and manufacturing facilities enables us to consistently uphold the highest standards of quality and efficiency in every product and solution we deliver.



OUR ENGINEERS

Dr. Stuart McIlwain, our Technical Director, leads our Edinburgh Design Hub with over 25 years of experience in the nuclear and HVAC industries. Under his guidance, our skilled engineers, known for their innovation and expertise, excel in delivering complex projects, reflecting diverse experiences spanning industry and academia.



Jodie Macleod, our research and development engineer, graduated from Heriot Watt in 2021 gaining a bachelors in Chemical Engineering. Jodie worked for Atkins as an assistant modeller for a little over a year before joining Turnbull and Scott at the end of 2022. Throughout Jodie's employment she has specialised in thermal energy storage using PCM for both the company's development and T&S clients.

RESEARCH BACKED DESIGN SOFTWARE

Our design methodology benefits greatly from the use of advanced software tools.

- **Finglow**, a key tool in our arsenal, enables us to design pressure vessels with high precision and efficiency.
- Our bespoke software, **S-Calc**, is specifically developed to calculate heat transfer and pressure drop accurately. This capability allows us to craft effective heat exchangers that are perfectly tailored to meet the unique specifications of our clients' projects.
- **HTRI** enables Turnbull & Scott to precisely optimise nuclear heat exchangers, ensuring peak performance and stringent compliance.
- **Modelica** is an acausal (not bounded by fixed inputs and outputs to complete the model) modelling language that is well suited to creating dynamic systems – it is used to simulate systems such as heat exchangers, phase-change energy stores, hotwell tanks and other products.
- This approach ensures that we deliver solutions that are not only efficient but also customised to our clients' specific needs.

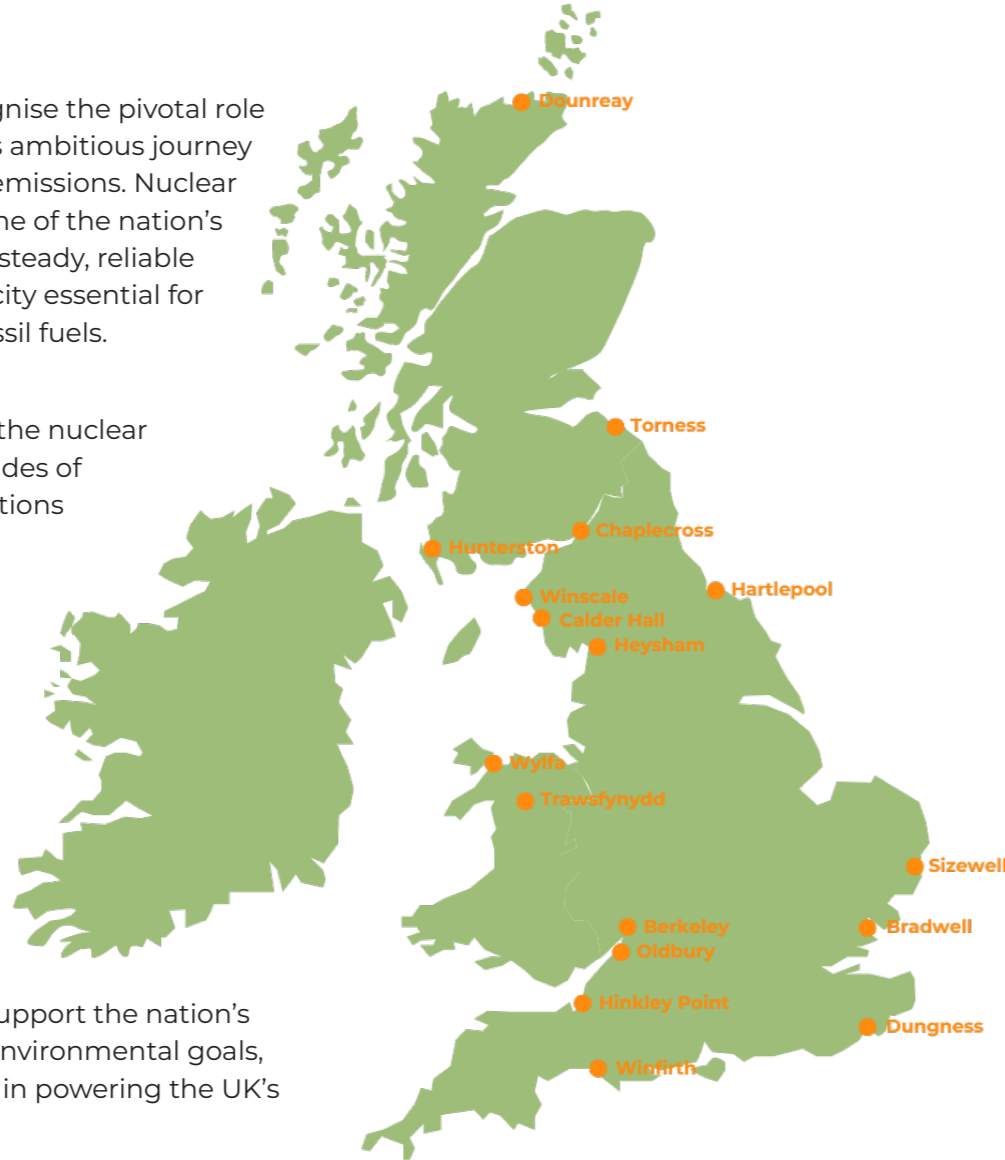
OUR FOCUS ON NUCLEAR

Explore our capabilities.

At Turnbull & Scott, we recognise the pivotal role of nuclear energy in the UK's ambitious journey towards achieving net-zero emissions. Nuclear power stands as a cornerstone of the nation's energy strategy, providing a steady, reliable source of low-carbon electricity essential for reducing dependence on fossil fuels.

Our extensive experience in the nuclear sector, underpinned by decades of engineering excellence, positions us uniquely to contribute to these critical projects. From designing robust **heat exchangers for nuclear reactors** to providing advanced thermal solutions, we are committed to enhancing the safety, efficiency, and sustainability of the UK's nuclear infrastructure.

Our contributions not only support the nation's energy security but also its environmental goals, making us a trusted partner in powering the UK's sustainable future.



NUCLEAR VENTILATION

Hinkley Point C, currently under development, is an example of Nuclear New Build in the UK that Turnbull & Scott are involved in.

We are providing high-quality heat exchangers for nuclear ventilation systems that are corrosion-resistant and suitable for various conditions including high-humidity weather for coastal sited nuclear plants.

Ventilation is a crucial part of the whole Hinkley Point project. Turnbull & Scott, with our 90 years of history in heat exchanger design and HVAC, is providing more reliable and long-service life products as well as solutions for this national project.

MOLTEN SALTS REACTOR

Our partner, renowned for their advances in the nuclear sector, selected Turnbull & Scott in 2021/22 for a pivotal design collaboration focused on creating heat exchangers for the intense environment within a molten salts reactor.

We engineered solutions that are not only robust and efficient but specifically tailored to withstand the challenging conditions of this innovative reactor technology. Our design exceeded the rigorous demands of the project, earning high praise from our partner for our contribution.

This partnership underscores our expertise and our longstanding commitment to delivering high-quality, bespoke solutions in the nuclear industry, reinforcing our position as leaders in technically demanding engineering projects.

OUR CONTRIBUTIONS

As an active member of the National Nuclear Vendors Forum (NNVF), we frequently speak at NNVF meetings, presenting our insights and contributing to the development of design guidelines that set industry standards. By advocating for best practices, we ensure that our expertise in heat exchanger design not only meets but elevates the benchmarks of nuclear industry specifications. Moreover, we share valuable Learning from Experience (LFE) insights, which enrich the collective knowledge and foster continuous improvement across the sector.

Our commitment extends to our strategic partnerships with the Nuclear Decommissioning Authority (NDA) and the Nuclear Industry Association (NIA), where we serve as a trusted supply chain partner, providing robust heat exchangers that support the UK's nuclear agenda. This collaboration underscores our dedication to advancing nuclear technology and enhancing safety and efficiency within the industry.

CONTACT US

Website: www.turnbull-scott.co.uk

For technical advice or quotations, one of our friendly technical sales engineers will be happy to help.

Telephone: +44 (0) 1450 372 053

Email: info@turnbull-scott.co.uk

Manufacturing Centre:
Unit 1A Burnfoot Industrial Estate
Hawick, Roxburghshire
Scotland, TD9 8SL

Design Hub:
4/1 New Lairdship Yards,
Edinburgh
EH11 3UY