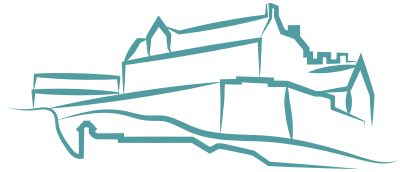


C A S T L E T O W N L A W



CASTLETOWN LAW

Delivery of Civil Nuclear Energy

Andrew Renton

Introduction

- Specialist international law firm
- Active in nuclear projects in UK, UAE, Europe and the Baltics
- Expertise in energy and infrastructure
- Nuclear energy
 - Large 1gw+
 - Small Modular Reactors up to circa 300mw
 - Advanced Modular Reactors generally less than 50mw

IBESA | BATTERY &
International Alliance | ENERGY
STORAGE

SABA
Scottish Africa Business Association

niA
Nuclear Industry Association



 **The Law Society**

 **Law Society of Scotland**

Egypt

- Egypt has considered establishing nuclear power since the 1960s. It has started construction on a nuclear power plant comprising four large Russian reactors with significant desalination capacity.
- As well as addressing power supplies, the NPPA expects to build four nuclear desalination plants.
- Our experience in Egypt suggests that a deep knowledge of local working arrangements and government incentives is essential. Having worked on the initial plans for the current NNB and on security centres for data management within Egypt, there is a strong relationship driven approach to working in sensitive areas.

Jordan

- Jordan was aiming to have two 1000 MWe nuclear power units in operation by 2025, but is now considering the use of small modular reactors instead. Jordan has significant uranium resources, some in phosphorite deposits. Jordan imports over 95% of its energy needs, at a cost of about one-fifth of its GDP.
- It has about 5200 MWe of generating capacity and electricity consumption is growing at about 3% a year.
- We have deep experience of working in Jordan, we have connections throughout government and at the most senior levels in government and at JAEC. We understand their policies, controls and restrictions. Nuclear in Jordan is a great ambition but previous projects have been fraught with difficulty.

Turkey

- Turkey has had plans for establishing nuclear power generation since 1970. Today, plans for nuclear power are a key aspect of the country's aim for economic growth. Recent developments have seen Russia take a leading role in offering to finance and build 4800 MWe of nuclear capacity.
- Construction of the country's first nuclear power reactor, the first of four at Akkuyu, commenced in April 2018.
- Having prepared the initial briefing for the ministry of energy and natural resources on the steps to be taken to pave the way for a regulatory structure which is compliant with international treaties for the Akkuyu project, we have been supporting others on the new NNB projects being progressed in Turkey.

Kingdom of Saudi Arabia

- Saudi Arabia has plans to establish a civil nuclear power industry. At present, virtually all of the country's electricity is generated by burning fossil fuels. The Saudi National Atomic Energy Project includes plans to build a nuclear power plant to help meet the sustainable development requirements outlined in the Saudi Vision 2030 roadmap.
- We have a long history of working in KSA and our colleagues at Amer Al ali and Khashoggi Law firms have worked in the nuclear and energy sectors for many years. We are looking carefully at the proposed plans for deployment in KSA and in our view small regionally based generation is more suited to the network and grid there.

Morocco

- The Moroccan governmental strategy aims to introduce nuclear energy beyond 2030. To this end, complementary studies are being developed using IAEA and ONEE-BE energy planning models and tools. These studies will look at the potential role of nuclear energy in the national electricity mix in the long term (2030–2050).
- We are exploring the potential for nuclear in Morocco with clients. This will include a discussion on the potential for advanced preparation funding through the NOFO scheme.

Kuwait

- Recent attendances and declarations show a return to consideration of nuclear power in Kuwait.
- We have some insight into what is developing in Kuwait in relation to energy policy. Security is a main feature of discussion at the moment and it seems the long term solution that nuclear can bring is an attractive option for them.

UAE

- The leading proponent of nuclear power and taking a clear and decisive approach to working with technology owners and vendors in establishing a low carbon energy future for the UAE.
- Much talked about at the moment – expect some major announcement during the next couple of weeks at COP 28.
- We have representative firms in the UAE with a resident CTL presence there.

Types of Nuclear Reactor

- Typically large reactor technologies are known and have been developed over several decades since the 1960's. They are generally referred to as Pressure Water Reactors (PWR) or Light Water Reactors (LWR).
- SMR are in general modularised small versions of existing technology reactors designed to be factory built and assembled on site from modules built in factories.
- AMRs are also modularised but use different technologies. They are suited to being part of industrial clusters and located near conurbations because of their inherent safety. There are several types of AMRs (sometimes referred to as micro reactors).

Types of AMR

- **GFR** is moving to a viable technology in development. Their helium cooling systems were proven and their high temperature operational capacity made them attractive to industrial uses. However there are no antecedents for development and a lot of research is still ongoing in relation to the technology. There is said to be ongoing metallurgical and fuel challenges to be addressed.
- **LFR** The technology is developing and although in 2020 a two stage development plan was envisaged to deploy reactors for industrial power and heat production use by 2025 that now seems to be moved back with a later date - potentially as late as 2035 being considered. The LFR is of particular interest because of its high temperature range and its use in industry and the focus on hydrogen production is creating a renewed interest.
- **MSR** There are several variants of MSR technologies. All depend on the high temperature to activate the coolant systems and their shut down phase is secure. More advanced designs have shown it possible to entirely separate the coolant materials from the fission materials thereby allowing the fission materials to be completely encased and made 100% safe from default risk in failure. There is a variant of the MSR called the Molten Salt Fast Reactor (MSFR). Technical reviews of MSR and MSFR suggest this technology is among the most promising for delivery of localised power heat and steam for all purposes and can be accommodated in a comparatively small site with a long intra fuelling cycle with limited operation requirements. The nature of the technology lends itself to a largely below ground deployment. Output ranges from 30MW up to 150MW as a general assessment.

Types of AMR

- **SFR** By 2020 the WNA had brought the Sodium Fast Reactor into consideration. This technology allows high energy output with low coolant volume and operates at relatively low pressure. It has a flexible fuelling requirement and can be adapted in design to operate on different types of fuel. In 2020 a number of SFR were under construction. There are currently two SFR operating in Russia, one in China and one under construction in India expected to be operational by 2014. There is development underway for approval of the technology for deployment in the USA.
- **SCWR** This is a super-efficient high temperature water cooled reactor. It operates at high temperatures and is useful in industrial applications. It is about 30% more efficient than the current designs of light water reactors. The enhanced design includes passive safety of the reactor's technology. There are several SCWR reactor designs already in operation at large reactor size and smaller designs are being considered in a number of jurisdictions.
- **VHTR** The technology involved is relatively well known. It is based on a graphite moderated helium cooled reactor. It is capable of very high temperature outputs. It is regarded as a potential favoured source of energy for thermochemical "green" hydrogen production. There are a number of similar reactors which are currently in operation or have been in operation historically.

Regulation and Legislation

- Provision of legal, transactional and regulatory services for development of nuclear power.
- Compliance with IAEA requirements and new technology applications - this is particularly important for AMR technologies.
- Support for nuclear power projects, governments, investors, suppliers, contractors and other stakeholders.
- Support in managing the legal services needed to give a full-service response on all aspects of a nuclear project.
- Early-stage logistics, consenting process, project architecture and structure, planning process, funding process and completion.

Developing Revised or new Legislation

- Specialist working with internal and adjacent teams to identify requirements and gaps.
- Identify steps and process to be followed, timeline and outputs.
- Work with local law firms, government and consultants to agree on steps.
- Direct support – such as in Estonia where we devised a programme for delivering their first legislation for a nuclear energy generation.
- Coordination and management of all inputs and aspects with a view to reaching the stage of acceptance by IAEA of the methodology and the first stage outputs.
- Once approved proceed to implementation through government.

Expertise in Nuclear

We recognise national differences in infrastructure and capacity.

- Not all countries have national or regional grids or networks.
- Not all governments have the appetite for or ability to fund big nuclear.
- Long lead times for big projects in terms of training, expertise and capability to be a competent nuclear nation may be daunting.
- Some countries have limited land and other resources.
- Experience suggests not all countries that have a nuclear legacy can deliver in a cost effective and timely way - France, Finland, UK cf - UAE.
- Nuclear energy is not just about electricity.
- Consider - Heat, steam, energy storage, decarbonisation.
- Each type of nuclear may have its own space to fill.
- AMR are particularly suited to integration with other forms of energy for local supply.

Advanced Modular Nuclear in context



<https://www.castletownlaw.com/papers/energy-transition-and-nuclear-energy>

Operational Fleet

- Critical areas of interest for compliance with standards to meet IAEA requirements are:
 - Strategic understanding
 - Nuclear liability status
 - Life extension- options
 - Export controls and safeguards
 - Nuclear security
 - Safety case compliance
 - Site licensing and delicensing
 - Environmental permits
 - Corporate governance issues
 - Regulatory reporting and safeguarding
 - Financing
 - Waste management and transport
 - Stakeholder management and engagement

Our Team



Andrew Renton
Castletown Law

Andrew leads on commercial and industry related issues. He is a leading solicitor in the energy and infrastructure industry, who specialises in commercial aspects of the sector across multiple jurisdictions. His approach to transaction and mandate management is endorsed and praised by clients and he is particularly known for structuring the architecture of complex projects and achieving a solution-based outcome for clients in some exceptionally complex multinational projects.



Simon Stuttaford
Castletown Law

Simon leads on Nuclear and Regulatory matters covering major projects from an environmental, planning and compliance point of view. His experience includes appointments as a leading team member on legal matters for Horizon Nuclear Power and as General Counsel and Company Secretary for EnergySolutions (PBO for Magnox Ltd, SLC). Simon was a Partner with the Legal Practice DWF where he was Head of Nuclear and Joint Head of Environment. Simon has developed and delivered an online Master`s level module on Nuclear Law for the University of Birmingham.

Our Team



Maroof Mittha
Castletown Law

Maroof advises on energy and infrastructure matters, focusing on international nuclear regulation and transactions. Recently, he has supported Simon in reviewing the International and EU nuclear legal frameworks to identify changes required in Estonian legislation. In the UK context, he has advised on the law and regulation of Plutonium stockpiles, use of Americium, review of the legislative framework in the context of advanced nuclear, UK taxonomy regime for nuclear as clean power, and additionality criteria for fuels produced from nuclear energy.

During his LLM in International Energy Law and Policy, Maroof focused on EU and International Nuclear Law, the legal framework for international project finance. His Master's dissertation, which received a Distinction in 2021, was on legal and policy developments on nuclear power under the European Union Law, assessing the relevance of the Euratom Treaty and nuclear decommissioning framework.



William Wilson
Castletown Law

William is an independent barrister and legal consultant, expert environmental and energy lawyer, with 25 years' experience, in government, consultancy and private practice. He worked for 9 years in the UK Government Legal Service at the Department of the Environment/DETR/Defra, which included managing UK and EU legislation, advising Ministers and the Department on UK and EU radioactive substances law. For example, on Sellafield THORP, MOX and emissions decisions and cases, drafting implementing EU legislation such as the Basic Safety Standards Directive and advising on environmental and nuclear law issues concerning the Atomic Weapons Establishments.

Our Team



Rob Higgins
Castletown Law

Rob leads on project delivery, major bid support and contract management. Rob has over 20 years' experience providing commercial legal advice within major projects and dispute resolution within nuclear, government, construction, PFI and rail sectors. His skills include coverage of project delivery, major bid support, contract management, corporate re-structuring, M&A, and public sector project procurement.

Reference Projects

EDF Energy NNB: Development of the plan for Hinkley Point C

This first major NNB plant in the UK since the early 1980's required major planning. Members of our team were heavily involved. The team led by Andrew Renton had members seconded into the EDF NNB team in London and Paris. Some of those team members had been heavily involved supporting Andrew in the pre-sale process of the British Energy fleet to EDF.

Andrew was also the partner responsible for overseeing the peer review of the environmental, ecological and social economic impact assessments for site selection for new NNB sites in the UK.

In parallel to the role in supporting EDF NNB on the Hinkley point project, Andrew also led a small team supporting the government Ministry Department for Environment and Climate Change which had responsibility for the renewal of mandates to the Office for nuclear regulation and the office for nuclear Development. In this role Andrew participated in [the oversight and preparation of cabinet papers for decision making](#) on the nuclear industry policy decisions in the UK. He was then involved in a small group along with members of other firms and DECC, in supporting the decision making on the process for supply chain involvement and industrial competences required to support the project.

The whole focus of nuclear industry activity in the UK around this time was the transition of ownership from British Energy to EDF and the delivery of the Hinkley Point C project and Andrew's team were at the heart of the activity.

EDF

On a variety of projects, including:

- » Helping the executive team set up a [Lean Six Sigma Improvement programme](#) involving the identification of High-Value Opportunities projects, facilitation of executive sessions and the design and delivery of multiple training, coaching and co-project leadership curriculums. The success in the initial programme meant that it spread quickly to other branches of the organisation, including sales and real estate. Delivering a return of €18m after four years.
- » Diagnosing and facilitating the development of a [three-year strategic plan](#) for a nuclear plant close to Paris.
- » Facilitating a [Human Resources activity improvement initiative](#), mapping and identifying quick wins aimed at decreasing the lead times of the most common employee procedures.
- » Supporting the Real Estate function, including Facilities Management and Building Work – in improving their [facilities cost predictions and monitoring](#), as well as helping develop an optimised approach to recycling across multiple sites.

Reference Projects

AREVA

On a variety of projects, including:

- » Facilitating **two innovation initiatives** in the zirconium sponges manufacturing plant – the former was focused on removing debris fretting on the tubes, using an innovative cladding; the latter aimed to develop innovative production scenarios to increase capacity, improve profitability and, at the same time, dramatically reduce environmental impact and industrial risks.
- » Helping the Transmission and Distribution Division to **develop and implement a decision framework** to identify sub-processes and activities to outsource.
- » Coaching the executive team on how to deploy a focussed **Lean Six Sigma improvement programme** that maximises business impact, including conducting a broad organisational and operational assessment to identify High-Value Opportunities for improving the technical specification process and field-related system software defects. The initial regional programme launch resulted in a 100% project success rate and delivered a return of \$2.7m (ROI of over 400%).
- » Supporting a **Global Operational Excellence Programme**, including nuclear business Supplier Development Programmes.

Horizon Nuclear Power Ltd

- » Supporting Horizon Nuclear Power Limited in submission of a **Nuclear Site Licence** Application to ONR.
- » Supporting Horizon Nuclear Power with environmental permits (i.e. water discharge activities, combustion permit activities, water abstraction, radioactive substances regulation activities), legal compliance training and drafting core policies and corporate governance issues.
- » Managing specific Horizon projects (site licensing and permit activities) together with **supporting Licensing and Permitting functions**.
- » Liaising with Regulators and key Stakeholders and advising on the contents of Horizon`s Environmental and Health and Safety Registers.
- » Advising Horizon on environmental/regulatory issues and **environmental compliance issues**, (i.e. waste transfer and transport requirements).

Simon Stuttford was part of Horizon Nuclear Power`s in-house legal team from 2015-2019.

Reference Projects

Magnox

- » Involved in the strategic role of a parent company (EnergySolutions, now part of the Atkins Group) over a licensed subsidiary, including oversight over safety case issues, security and enforcement issues.
- » Reviewing and advising on Magnox Framework Agreements and representing company in negotiations with the NDA over amendments and consolidation of the PBA and M&O Contract relating to the Magnox sites.
- » Advising and drafting on commercial agreements including Memorandums of Understanding, Collaboration Agreements, Joint Venture Agreements, Consortium and Teaming Agreements for EnergySolutions.
- » Playing an active role (including commercial dialogue) in Magnox/RSRL PBO Competition under the Public Contracts Regulations 2006.
- » Advising the Board on legal and compliance issues, risk management and corporate governance.
- » Implementing new anti-bribery policy, guidance and procedures in compliance with UK Bribery Act 2010 together with advising on data protection policy issues and information requests.
- » Advising on trademark and intellectual property issues as well as Employment and Consultancy Agreements.
- » Managing Company's property and insurance arrangements, together with legal budget and external lawyers.
- » Advising on policy issues including implementation of changes to UK legislation following changes to the Paris and Brussels Conventions on nuclear third-party liability and UK radioactive waste policy.
- » Providing stand-alone advice to clients on regulatory compliance, including radioactive substances, waste and waste packaging, waste shipment regulations, carriage of dangerous goods and the Environmental Permitting Regulations.
- » Advising on licensing and delicensing issues including compliance with license conditions, nuclear liability insurance, transport, safeguards, security, interpretation of the "no danger" principle etc.

Simon Stuttaford was General Counsel and Company Secretary for EnergySolutions, PBO, and Company Secretary for Magnox Ltd for the period 2011-2015.

Reference Projects

Moorside Site, Cumbria

- » Advising KEPCO on their initial involvement on acquisition of a shareholding in the ownership of the Moorside site.
- » Leading negotiations for [approval of the AP1400 technology](#) for deployment at the Moorside site.
- » Working alongside the financial and technical advisors and the KEPCO team in intense discussions with DECC to achieve a [final investment decision](#) from KEPCO.
- » Due diligence and advisory work on the GDA process and the technical requirements for KEPCO to enter the UK nuclear market.
- » Due Diligence on the existing shareholders and financial support for the existing site licence holder and detailed negotiations with other shareholding interests.
- » Advising on the process for entry into the UK market, the technical and legal requirements including [the regulatory structure in the UK](#) for safety and security during the process of approvals, consents, construction, commissioning and operation.

Andrew Renton was part of a team of lead advisers to KEPCO for the period 2014 to 2016/17.

Ministry of Environment and Government of Estonia

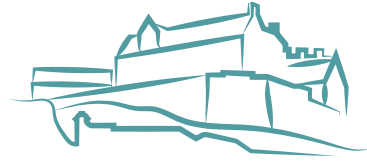
Appointed to advise the Ministry of Environment and the Government of Estonia on:

- Analysis of existing Estonian legal framework and legislation and suitability for a nuclear energy programme.
 - Definition of the scope for the proposed new Estonian nuclear regulator, and other key institutions.
 - [Defining the legal framework for civil nuclear developments in Estonia.](#)
 - [Development of a new nuclear law.](#)
- » Simon has led the Castletown Law workstreams with support from Maroof Mittha and William Wilson.
 - » The work has involved a thorough [review of the International and EU nuclear legal frameworks](#) as well as a comparative analysis of modern nuclear legislation and regulation in other jurisdictions to identify changes required in Estonian legislation.
 - » The focus has been to develop a regulatory framework that functions for the more efficient and effective delivery of advanced nuclear technologies.
 - » Development of a new overarching nuclear law has entailed a detailed analysis of international best practice and specific recommendations utilising Castletown Law`s experience in other jurisdictions, and its knowledge of compliance with the IAEA required approach.

Reference Projects

Advisor to Cross-Party Nuclear Legislative Association

- » The objectives of the Association are to promote better legislation and regulation of the nuclear industry in the UK.
 - » The work has involved: identifying which parts of the UK legislative programme to work on; identifying new legislative or regulatory initiatives which could benefit the decarbonisation of the UK economy; advising members of the Association on current legislative processes; developing and maintaining links with industry, academia, consultants and civil society to understand current developments in the sector; establishing and maintaining contact with relevant international bodies; establishing and implementing a communications plan to ensure that relevant bodies are aware of the Association's work and its aims.
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Thank you

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