

MANCHESTER

At the Heart
of the UK's Civil
Nuclear Industry



MIDAS

MANCHESTER INVESTMENT
DEVELOPMENT AGENCY SERVICE
www.investinmanchester.com

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Photography with thanks to:

Sellafield Ltd
The University of Manchester

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“Best UK City to Live”

Economist Intelligence Unit, 2013

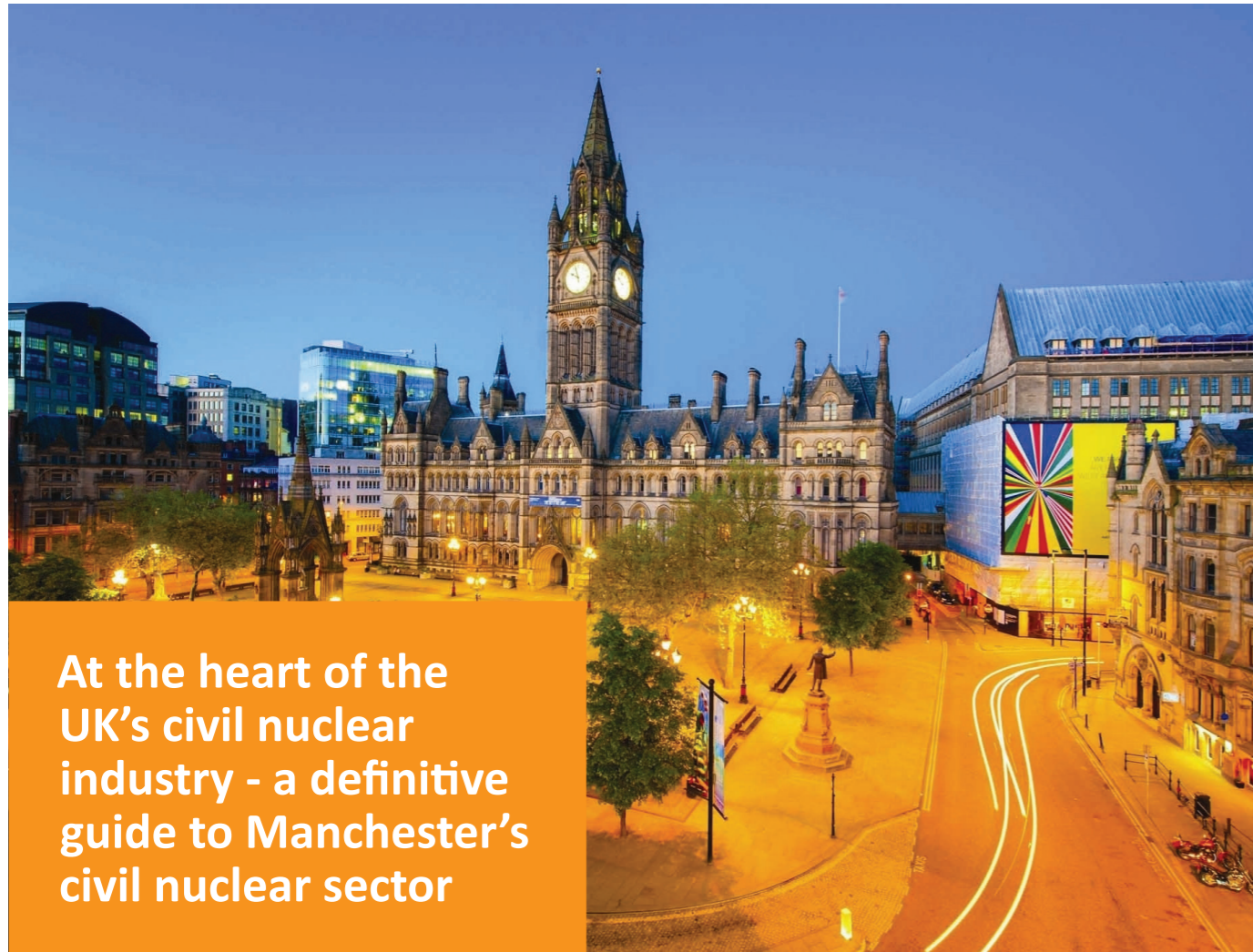
“Number One Region in the UK for FDI Job Creation”

Ernst and Young UK Attractiveness Survey, 2013

“Number One City in the UK to Locate a Headquarters”

Cushman and Wakefield, 2013

Welcome



At the heart of the UK's civil nuclear industry - a definitive guide to Manchester's civil nuclear sector

Manchester is proud to be at the heart of the UK's civil nuclear industry. With unparalleled access to a world-renowned skills base and pioneering expertise in nuclear research and development, it is the ideal location for nuclear businesses.

As the birthplace of nuclear physics, including four Nobel Prize winners for their contributions to research in this area, Manchester is internationally recognised for its rich nuclear research heritage, and today is placed at the forefront of nuclear power and research.

Nuclear research and education is spearheaded by The University of Manchester, the largest and most connected community of nuclear academics and researchers anywhere in the UK. With more than 300 researchers and over 1,000 students undertaking nuclear study, it is recognised as a world-leader in nuclear power research and education.

Manchester and the wider North West region have a thriving and established ecosystem of over 250 civil nuclear supply chain companies. Together these provide an unrivalled breadth of civil nuclear capability into the smallest geographic region to be found anywhere in the world. With strengths in construction, engineering and manufacturing, Manchester has some of the UK's most distinguished design, civil and mechanical engineering consultancies.

As the nuclear renaissance continues to gather pace, the UK is set to embark on a significant civil nuclear build programme estimated to be worth at least £60 billion. In addition, a nuclear decommissioning programme worth around £3 billion per year is already underway to safely decommission the UK's existing nuclear power fleet.

Thanks to Manchester's central location and world-class connectivity, the city provides a natural base for any business wishing to exploit the significant opportunities presented by both UK and global civil nuclear markets.

Why Manchester

At the heart of the UK's civil nuclear sector, Manchester provides access to:

New build markets

With an estimated market value of £60 billion, Manchester is in easy reach of all the UK's new build sites. This includes Wylfa and Moorside based just 200km from Manchester.

Decommissioning sites

With the UK currently spending approximately £3 billion per year on a decommissioning programme, Manchester is centrally located to all the sites including Sellafield, the world's most challenging site.

Current operations

Manchester is centrally located to all remaining operational plants providing important access to the UK's Plant Life Extension (PLEX) markets which are estimated to be worth £1.5 billion by 2025.

Vibrant nuclear cluster

Manchester has more than 120 nuclear related companies and is located at the heart of one of the largest civil nuclear clusters in the world.

Dalton Nuclear Institute

The University of Manchester is home to the Dalton Nuclear Institute, an internationally recognised centre of excellence with a track record of collaborating with industry.

Talent

Over 50% of the UK's civil nuclear workforce is based in Manchester and the wider region. Businesses located here can also access the talent pipeline of over 1,000 nuclear students graduating from Manchester each year.

Nuclear centres of excellence

Manchester is closely located to many of the UK's key nuclear organisations including the world-renowned National Nuclear Laboratory and Office of Nuclear Regulation.

International connectivity

Manchester is home to the UK's largest regional airport serving 200 locations worldwide, and is ideally positioned to exploit the burgeoning global nuclear market.

Specialist nuclear professional services sector

Manchester hosts one of the largest professional nuclear services sectors outside London, providing financial and legal expertise.



Media City UK

Market Opportunities

At the heart of the nuclear renaissance, Manchester provides a natural base for any business wishing to exploit the significant opportunities presented by both UK and global markets.

Key opportunities

Nuclear new build

A major nuclear new build programme estimated to be worth at least £60 billion is now underway after an agreement was reached to construct the first nuclear power station in the UK for nearly 20 years.

Considered to be the most significant opportunity for the UK's energy economy since the exploitation of North Sea oil and gas, this programme is expected to create an estimated 16GW of capacity by 2030. Of the five confirmed sites, both Wylfa and Moorside (near Sellafield) sit within 200km of Manchester, with the remaining sites easily reached via Manchester's excellent transport networks.

Current operations and life extensions

Additional opportunities exist through the continued management and Plant Life Extension (PLEX) of the UK's current nuclear fleet (both reactors and fuel cycle facilities). With a market estimated to be worth £1.5 billion by 2025, the UK is considered to be one of Europe's major PLEX markets.

Global opportunities

Manchester and its wider region have a long history of exporting services to international markets, with exports in 2011/12 estimated at £32 million. With global investments expected to top £1 trillion over the coming decades, businesses located in Manchester will be able to make the most of the opportunity and draw on the region's strong heritage in this sector and its enviable skills base.

Nuclear decommissioning

The UK is currently spending around £3 billion annually on a challenging decommissioning programme to clean up and safely close down the UK's older power stations, research facilities and fuel plants.

Almost half of this funding (£1.3bn) is spent at Sellafield, one of the world's most challenging decommissioning programmes which is expected to last for 100 years. A further eight sites are within 300km of Manchester, with the remaining sites all within easy reach thanks to Manchester's central location.

Fuel cycle services

The development of fuel designs, the improvement of spent fuel processes and the creation of advanced fuels for new reactors are vital for the continued security of the UK's nuclear power supply.

As the only area in the UK with full fuel cycle capabilities, Manchester and the wider region undertake everything from uranium conversion and uranium enrichment to fuel manufacture, power generation, fuel reprocessing, and waste management and decommissioning.



Global Market Opportunities

£930bn

Global new build market value

£19.2bn

Estimated worth of global PLEX market by 2025

£250bn

Global decommissioning market value

Existing and Proposed Nuclear Power Stations in the UK

- Confirmed new sites
- Sites currently generating
- Shut-down sites

*Shut-down site known as Calder Hall. Confirmed new site known as Moorside.



“As a global supplier of services to the civil nuclear industry our Manchester office provides an important access point to the UK markets whilst also being on the doorstep of one of the UK's top international airports, providing frequent and direct flights to our international client base.”

James Reynolds
Head of Nuclear, Addleshaw Goddard

UK Market Opportunities



**New build
£60bn**



**Decommissioning
£3bn/year**



**Current operations
£1.5bn**

Established Skills and Expertise

Manchester offers direct access to the UK's largest and most diverse civil nuclear supply chain.

Historically, Manchester's supply chain has grown on the back of Calder Hall, the world's first commercial nuclear power station opened by the Queen in 1956. Today, Manchester has more than 120 nuclear supply chain companies employing an estimated 3,000 people.

With a strong reputation for engineering, Manchester boasts some of the UK's most distinguished civil, construction and mechanical engineering and design consultancies. These include Arup, Balfour Beatty, Cavendish Nuclear, Costain Ltd, Jacobs Engineering Group Inc and Sir Robert McAlpine.




In addition to this, Manchester is home to the UK's largest regional financial and professional services sector employing over 250,000 people. Key companies located in Manchester include Addleshaw Goddard, DLA Piper, Eversheds, Pinsent Masons, Ernst & Young, and Mazars.

"The North West of England and Manchester in particular has been the hub of nuclear design engineering for the past 60 years. Manchester is home to many of the large civil and process engineering companies and therefore the region is rich in experienced engineers and technicians who have the skills to design and build nuclear facilities."

Alistair Smith
Nuclear Development Director, Costain Ltd



Manchester and the North West's Civil Nuclear Sector at a Glance

120	Civil nuclear businesses in Manchester	
3,000	Employees in Manchester's civil nuclear sector	
50%	The percentage of the UK's civil nuclear sector workforce working in Manchester and the North West region	

Wider sphere of influence

With a central location backed by an excellent road, rail and air network, Manchester offers unrivalled access to nuclear expertise from the surrounding region. Consisting of over 250 nuclear supply chain companies and supporting service providers, this extends the available labour pool to an estimated 25,000 people, representing over half of the UK's civil nuclear industry.

With twice the number of companies and employees than other European nuclear clusters, the region provides unparalleled access to a wider range of nuclear capability in a more focused area than found anywhere in the world.

Manchester and the North West's Supply Chain Expertise

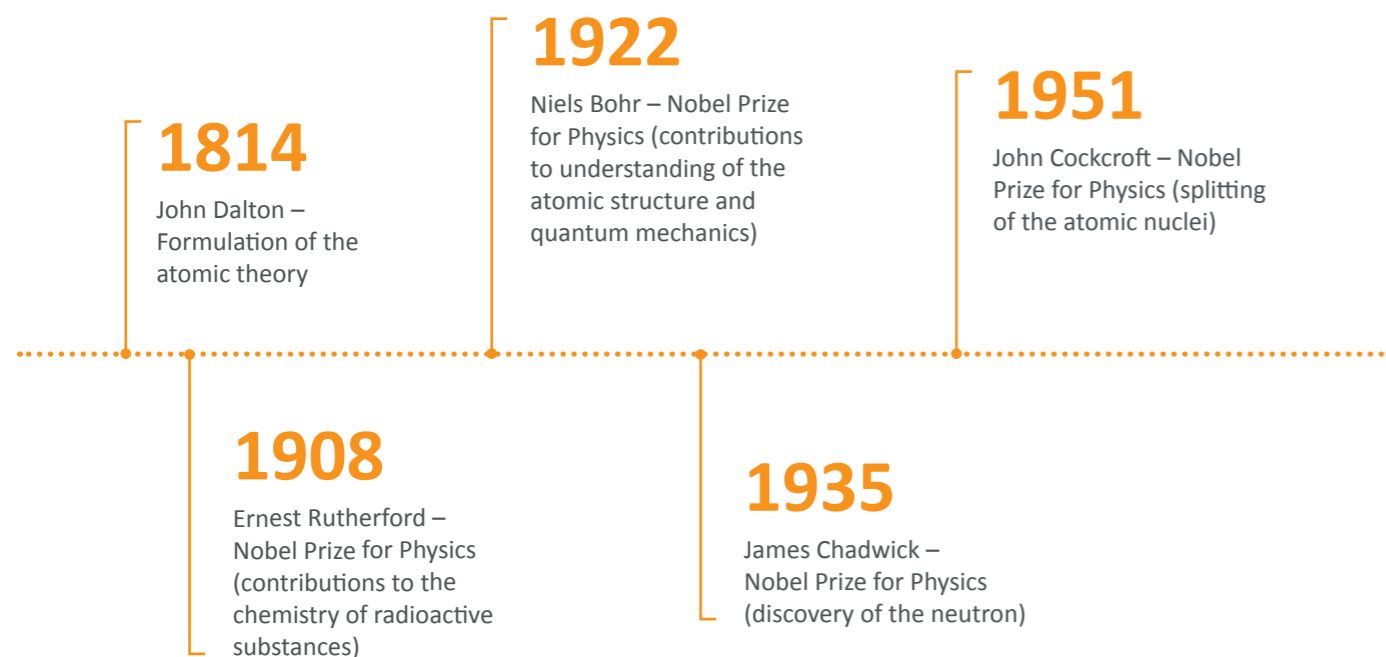


World-Class Research Expertise

Home to four Nobel Prize winners for their contributions to nuclear physics, Manchester boasts a rich nuclear research heritage and has always maintained its position at the forefront of nuclear power research.

Manchester is home to one of Europe's largest student populations with around 100,000 students studying at four universities. Together these universities produce approximately 6,000 Science, Technology, Engineering and Mathematics graduates each year.

Manchester's Historic Nuclear Achievements



NNUMAN

Meeting the future needs of the nuclear industry

The New Nuclear Manufacturing Programme (NNUMAN) is a major UK government and industry funded programme led by The University of Manchester with support from The University of Sheffield. NNUMAN provides an early stage test facility for businesses with novel technologies and processes to support the future needs of the UK nuclear industry.



The University of Manchester

The University of Manchester is the largest single-site university in the UK, with nearly 40,000 students. With more than 300 researchers and over 1,000 students undertaking nuclear study, The University of Manchester has the largest and most connected community of nuclear academics and researchers anywhere in the UK.

Nuclear research and education is led by the University's Dalton Nuclear Institute. A major asset of the UK's nuclear innovation scene, it is the UK's leading provider of higher education learning and research in nuclear science and engineering. In 2012, the Dalton Nuclear Institute was awarded the prestigious Queen's Anniversary Prize in recognition of its internationally renowned research and training for the nuclear industry.

State-of-the-art facilities

The University has established some of the most sophisticated and cutting-edge nuclear research facilities in the UK including:

- The Dalton Cumbrian Facility which provides world-leading research in radiation science and nuclear decommissioning
- State-of-the-art equipment for materials testing in reactor environments
- Radiochemistry and geoscience
- Access to active laboratories at the National Nuclear Laboratory
- The Manufacturing Technology Research Laboratory
- National Fuel Centre of Excellence

Industry collaborations

The Dalton Nuclear Institute collaborates with over 30 academic institutions across the UK and around the world including:

- AREVA
- Westinghouse
- AMEC
- Rolls-Royce
- EDF Energy
- Sellafield Ltd
- Nuclear AMRC
- Battelle
- National Nuclear Laboratory
- Nuclear Decommissioning Authority

Nuclear centres of excellence in and around Manchester

In addition to The University of Manchester, Greater Manchester hosts three other universities that contribute research and expertise to the nuclear industry including Manchester Metropolitan University, the University of Bolton and the University of Salford.

As well as these, many of the UK's further education, private sector training and research facilities are based in North England, all easily accessible due to Manchester's central location.



01. The University of Manchester
02. University of Salford
03. Manchester Metropolitan University
04. University of Bolton
05. ENERGEN (National Skills Academy Nuclear – NSAN)
06. Cockcroft Institute of Accelerator Science and Technology
07. University of Liverpool
08. Lancaster University
09. University of Central Lancashire (UCLAN)
10. Warrington University Technical College
11. University of Leeds
12. The University of Sheffield
13. Nuclear AMRC
14. National Nuclear Laboratory
15. National Fuel Centre of Excellence

Case Study Rolls-Royce



Rolls-Royce returns to Manchester

Manchester has always been significant to global giants Rolls-Royce since the founders Charles Rolls and Henry Royce met in the city's Midland Hotel. Now, over a 100 years later, the power engineering firm has retraced its roots back to the region and forged ties with The University of Manchester and the internationally renowned Dalton Nuclear Institute.

With its UK civil nuclear engineering base located in Birchwood, just outside Manchester, Rolls-Royce delivers nuclear engineering services for customers in the UK and overseas. Establishing a base in the North West provided Rolls-Royce with access to a wealth of nuclear-focused businesses and world-class skills and capabilities.

In 2013, Rolls-Royce invested £1.1 billion on research and development by supporting a global network of 29 University Technology Centres, which connect the company's engineers with the forefront of scientific research. One of these, dedicated to nuclear research, is located at The University of Manchester. With a clear vision to support the future development of nuclear technology and engineering, it supports the continuity and quality of the University's nuclear programmes whilst providing Rolls-Royce with access to world-class research expertise.

Research at the University Technology Centre covers:

- Properties of fissile and engineering materials
- Modelling of processes in nuclear plants
- Nuclear safety and reliability
- Applications in civil nuclear programmes
- Nuclear component manufacture

“Rolls-Royce is proud to have an association with Manchester and its world-leading research capabilities. Working in collaboration with The University of Manchester provides Rolls-Royce with access to cutting-edge research expertise and a skilled graduate base.”

Dr Martin Goodfellow
Nuclear Engineer, Rolls-Royce

Case Study AREVA



The world leaders in the design and construction of nuclear reactor systems choose Manchester

AREVA are the global nuclear power industry leader as well as a major player in the renewable energy sector. In 2012 they signed a collaboration agreement with The University of Manchester's world-leading centre for nuclear research and education, the Dalton Nuclear Institute. This included AREVA's sponsorship of two PhDs in Materials research, a visiting professorship and access to a pan-European network of academic nuclear research.

With its first-class nuclear power research expertise, The University of Manchester was an obvious UK research partner for AREVA. The company, who employs 2,000 people in the UK, works with many of the UK's nuclear power plants and constantly reviews its operations to ensure that the safest and most competitive nuclear applications can be developed.

Through the partnership, AREVA can share technological issues and propose future research as well as access a skilled pool of graduates and a substantial network of UK universities and laboratories working on nuclear research and development.

“AREVA is delighted to be working in collaboration with the world-renowned Dalton Nuclear Institute at The University of Manchester and we are looking forward to expanding our links with the University as part of a growing Anglo-French collaboration network.”

Jean Dhers
R&D Director, AREVA

About MIDAS

MIDAS, Manchester's inward investment agency, can help you and your business with relocation and expansion plans. MIDAS has a reputation for understanding diverse business needs and helping to remove any barriers for companies looking to locate or expand into Manchester.

Their specialist business development team can assist you with a range of free, bespoke packages of confidential support that will make your journey as smooth and simple as possible.

The services provided by the team, which are also available to intermediaries such as location consultants, will save you money, time and effort and will enhance your project with the expert knowledge and local intelligence that result in a faster and more successful move.

MIDAS Services

Free support includes:

- Research support and business case development
- Introductions to local networks
- Recruitment and training support and advice
- Property solutions
- Relocation advice and assistance
- Post-investment PR support

See how MIDAS can help you make Manchester part of your success story.

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MANCHESTER - BUILT FOR SUCCESSFUL BUSINESS

With a skilled commuter population of over seven million people, outstanding IT connections, a world-class property portfolio – not to mention significantly lower costs than London – it's no wonder Manchester has been recognised as the most competitive business location in Europe.*

Whether you are looking for a large development site, new office space or local business networks, MIDAS – Manchester's inward investment agency – offers a range of services that makes investing in Greater Manchester easy.

MIDAS provides an extensive package of expert, free and confidential advice for companies looking to expand, grow and locate in Greater Manchester. Our services are also available to location consultants.

To become part of Manchester's success story, contact us on:
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www.investinmanchester.com

*KPMG Competitive Alternatives, 2014

