

# NORTH WEST



**THE  
STATE  
OF THE  
NATION**

**INFRASTRUCTURE  
2014**

## UK OVERVIEW

Infrastructure is vital to society – our quality of life depends on it functioning effectively and our reliance becomes painfully evident when infrastructure systems fail.

The UK's ability to compete in the global race and to generate and sustain economic growth with appropriate quality of life depends on infrastructure networks that provide predictable energy generation and distribution, water supply, waste management and the transportation of people and essential goods into and around the UK by rail, road, sea and air.

State of the Nation is ICE's flagship report on the current state of the UK's infrastructure. The 2014 State of the Nation Infrastructure report assesses the performance, capacity and condition of the UK's economic infrastructure networks, and determines the actions required in order to improve and enhance performance, and importantly, to ensure that our infrastructure is resilient when faced with the many challenges ahead – from climate change to population growth.

## INFRASTRUCTURE 2014

North West England is home to over seven million people making it the third most populous UK region. The majority of its population lives in urban regions which are well served in terms of infrastructure, while planning and engineering challenges exist in providing high quality services for more rurally based communities.

The region produces a wide range of its energy requirements, with Cumbria's Energy Coast being a hub, both of nuclear and alternative energy generation.

Recent alleviation schemes have also played a key role in reducing the instances of flooding in historically blighted parts of the region. Carlisle, Cockermouth and Keswick have all seen their resilience to flooding improved as a result. Further south, the region is dominated economically and culturally by the Liverpool to Manchester corridor. Here, a significant concentration of strategic infrastructure developments are either underway or at an advanced planning stage.

The Mersey Gateway second river crossing, Northern Hub rail project and Manchester Victoria Station upgrade are set to play key roles in supporting the new Port of Liverpool post-Panamax container terminal to the West and the proposed Manchester Airport City to the East.

## ENERGY

The North West has expertise in the nuclear and wider power sector and is well supported by renewable resources. This makes the region well placed to support the UK's transition to a low carbon economy.

The energy sector is a key economic driver for the North West, with the nuclear industry contributing to the regional economy through Sellafield and Heysham.

## CURRENT STATUS

Nuclear generation currently provides a large proportion of the region's electricity. Heysham 1 and 2 are both operated by EDF and have a total output of some 2.4GW, powering

**GRADE**  
**B-**

**ENERGY**

**RECOMMENDATIONS**

Parliament should enact the secondary legislation to implement Electricity Market Reform (EMR) by the end of this Parliament, establishing long-term investor confidence and entrenching cross-party support for electricity decarbonisation

some 5M homes. Heysham 1 is due to enter decommissioning in 2019 with Heysham 2 planned to follow in 2023.<sup>1</sup>

Fiddler's Ferry coal and biomass power station has been operating since 1973. Its four 500MW generating units provide the power station's total of 2,000MW in output.<sup>2</sup>

Gas generation capacity is centred on the combined cycle gas turbine (CCGT) plant at Rocksavage in Cheshire.

The North West has significant wind generation, centred principally upon offshore developments, Walney, Ormonde, Barrow and Burbo bank. On shore developments account for significantly less in terms of total wind generated output and are dominated by the Scout Moor facility in Lancashire.

Failure of supply is rare, suggesting a high level of current resilience, asset care and capacity. However, major concern remains over the lack of strategic vision for a component of the UK's infrastructure so vital both to the economy and our communities.

1. <http://www.edfenergy.com/about-us/energy-generation/nuclear-generation/nuclear-power-stations/>  
2. <https://www.iema.net/system/files/fiddlers20ferry20nts20feb202010.pdf>



Image courtesy of Merseytravel



### FUTURE DEVELOPMENTS

New nuclear development is planned by Nugen (a consortium of GDF Suez and Iberdrola) at Moorside in Cumbria but is currently at an early stage of development. New gas capacity of some 0.8GW is planned for Carrington in South Manchester, scheduled to open in 2016.

Wind power development continues at West of Duddon Sands Offshore Wind Farm, a joint venture project between ScottishPower Renewables and Dong Energy, comprising 108 wind turbines.

While these developments are to be welcomed, it is unlikely they can provide sufficient energy to meet the shortfall in energy generation as nuclear sources are de-commissioned.

### TRANSPORT CURRENT STATUS

The condition of regional road network is a cause for concern and there are signs of serious deterioration on North West highways. Parts of the West Coast Main Line are already operating at capacity. The Northern Hub is a key project which will free up capacity and reduce journey times across the North of England. Rail electrification between Liverpool and Manchester now underway.

227 million bus journeys are made in Manchester alone per annum. Services across the region have stabilised in the decades since deregulation and are seen to be improving in urban areas, but questions remain over quality partnerships and rural service levels. Regarding the carriage of freight, transformational projects are required to promote economic growth. Manchester's Metrolink network continues to expand, with annual passenger journeys standing at 19 million.

### FUTURE DEVELOPMENTS

The North West stands to benefit economically and socially from a wide range of large scale projects due on stream over the next two decades. The strategically significant Northern Rail Hub is already under development, along with the Mersey Gateway second river crossing. ICE North West has welcomed plans to accelerate HS2.

There should be continued development of freight links, particularly road and rail links in support of major port developments. Liverpool's post-Panamax terminal is due for completion in 2015 and will be served by 10 motorways within 10 miles, in addition to rail connections with major UK population centres. A container service will connect Liverpool2 directly to Manchester via the Manchester Ship Canal.

Estimates of the cost of congestion vary, but official data suggests that direct costs were around £2 billion in 2010, and would rise to £8.6 billion in 2040 in the absence of intervention.<sup>3</sup>

To ease problems in the medium term, government is planning to re-organise the Highways Agency to provide it with stable funding and clear strategy.

Strategic infrastructure is well maintained but now expiring, while local infrastructure provision and maintenance is underfunded. Air quality impacts are a particular issue as a consequence of regular traffic congestion in certain urban areas.

### CASE STUDY

#### MANCHESTER TO LIVERPOOL RAIL ELECTRIFICATION

Liverpool and Manchester currently have established connections with all the major UK conurbations, particularly across the North. However, rail services between the two most important cultural centres in the North of England have failed to keep pace with the growing attraction of these cities in terms of commerce and tourism. Services are operating at capacity, while much of the current rolling stock is time expired.

Furthermore, the current expansion of Liverpool's port and the planned development of Manchester Airport City make a compelling case for improved passenger and freight capacity and journey times.

Under the ambitious Northern Hub programme, Network Rail is now addressing this issue by constructing new electrified lines between Liverpool and Manchester via Newton-le-Willows. This will enable fast trains to overtake the slower stopping services and cut journey times between the cities by 15 minutes to just over half an hour.

Network capacity will also be increased, with four trains an hour ultimately serving the cities and delivered by newer, faster trains to replace the obsolete 'Pacer' class units.

Electrification is a pivotal feature of the strategic Northern Hub, which will also resolve the long standing bottleneck of lines in and around Manchester which have historically restricted the potential for faster journey times and more direct services across the North of England.

GRADE

C+

### TRANSPORT

#### RECOMMENDATIONS

North West transport authorities and relevant bodies should follow the Greater Manchester Combined Authority model by developing a comprehensive long-term transport strategy and implementation programme, with an associated funding package

3. DfT draft 'National Networks National Policy Statement' (2013) <https://www.gov.uk/government/consultations/national-road-and-rail-networks-draft-national-policy-statement>



GRADE  
**B**

**WASTE MANAGEMENT**

**RECOMMENDATIONS**

A move from waste to resource management and a circular economy should be at the centre of government policy across the UK

**WASTE MANAGEMENT  
CURRENT STATUS**

The national long term trend for landfill usage is in decline, despite some minor year on year increases in recent years. 165.1 million tonnes of waste were generated in 2008 by households, commercial & industrial businesses and the construction sector. This is a decrease from 5Mt in 2006.<sup>4</sup>

The increase in recycling and reuse continues although this can vary across sectors and waste streams. This is particularly prevalent in the municipal waste stream, where local recycling rates can vary from over 60% to below 30%. Greater Manchester's infrastructure investment has assisted its local authorities to achieve some of the higher recycling rates in the North West.

**FUTURE DEVELOPMENTS**

Although waste cannot be eliminated, through thinking in circular rather than linear terms at all stages it can be better managed and become a resource. The establishment of a circular economy will require leadership from policy-makers, embedding the idea across government, for example through broadening the ban on sending materials to landfill/ Energy from Waste (EfW) and developing minimum reuse/recycling targets similar to under End of Life Vehicles legislation

While data for MSW is reasonably well recorded, in the commercial and industrial sector - estimated to produce around double the annual tonnage of MSW - the available figures are outdated and often inaccurate. Without rigorous data, resource management (and, it follows, a circular economy) become difficult to implement. This not only affects investment in the waste sector but also has negative effects on other sectors, for example by creating uncertainty for EfW and associated Combined Heat and Power operators.

There are indications of movement toward effective use of the waste hierarchy through site based segregation, in-house recycling facilities and the 'designing out' of waste. However, challenges remain over consistency in recording recycling within the sector.

Waste recovery through incineration is a developing picture within the North West, with significant capacity due to come on line in the near future.

**WATER  
CURRENT STATUS**

Climate change is expected to increase these pressures by altering frequency and distribution of rainfall, increasing temperatures and increasing frequency and severity of extreme weather events.

For water resources, modelling suggests that on average, natural annual flows could decrease, particularly during the summer. These changes may put substantial pressure on surface and groundwater supplies and quality.

Ofwat has recognised the need to shift regulatory incentives to encourage a Total Expenditure (TOTEX) approach to investment such that the total costs of delivering a given set of improvements is minimised while providing customers with best value.

Defra is currently consulting on changes to abstraction licences in England and Wales. The pressures from climate change and population growth mean that water availability will be less predictable in the future; therefore, the manner in which water is abstracted will have to change.

**FUTURE DEVELOPMENTS**

Governments, industry, agriculture and the public must better understand their water use and should be empowered to change the patterns of their water consumption. Managing water at the catchment level is an effective way of improving collaboration and understanding of water use among abstractors.

The importance of real time data and actual abstraction figures should be recognised as they provide regulators with a better understanding of the nature of water use from all sectors.

GRADE  
**B**

**WATER**

**RECOMMENDATIONS**

- Economic regulators should ensure that Total Expenditure (TOTEX) approaches and the use of soft engineering, such as catchment management, are fully incentivised through the economic regulatory system. Water and sewerage companies should ensure that they use these new approaches to deliver resilient and sustainable infrastructure
- Devolved governments and regulators should introduce metering, complemented by social and discretionary tariffs, throughout the UK. This will enable water and sewerage companies to monitor leakage more accurately, and more effectively incentivise water conservation, without adversely impacting low income households

Metering, which is now extensive in some areas of the UK, is an effective way to enable both water utility consumers to manage their use, and for water companies to fully understand how water is being used. Smart water bills, which provide customers with clearer information on the nature of their water use, should also be introduced. Universal metering will also enable Water and Sewerage Companies to monitor leakage more accurately and effectively.

ICE believes that new water resources, additional storage and more inter-company transfers will also have to be developed to close the long-term supply/demand imbalance in some regions, as part of an integrated strategy which includes demand management and selected areas of water reuse.

4. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69401/pb13540-waste-policy-review110614.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69401/pb13540-waste-policy-review110614.pdf)



Image courtesy of Environment Agency



## GRADE

# B

### FLOOD RISK MANAGEMENT

#### RECOMMENDATIONS

The Environment Agency and Lead Local Flood Authorities should fully implement a holistic approach to flood management, which includes land use planning, upstream catchment measures, flood defences and increased infrastructure and buildings flood resilience

#### CASE HISTORY

##### KESWICK FLOOD ALLEVIATION SCHEME

This £24m Environment Agency scheme has helped safeguard Keswick from future flooding, in addition to improving water quality at an important local lake. The project included a strong community focus, including the construction of a combined new control building and youth centre, plus contractor assistance in relocating a mother & toddler group to new premises. Flooding from rivers, surface water and foul sewers has historically impacted on communities and businesses, with the most recent serious event occurring in 2009. The environmental aspect of the scheme has improved water quality in Bassenthwaite Lake, a Site of Special Scientific Interest, which had high phosphate levels in its catchment. The project has also delivered a new sewer network for the town, plus improvements to the wastewater treatment works.

##### The three year project involved:

- Rebuilding 90 per cent of the wastewater treatment works
- New outfall in the River Derwent
- New combined storm storage tank, pumping station and powered screen
- New combined control building and youth centre
- Upsizing and relaying 1.5km of sewers throughout Keswick town centre

The project increased capacity at the town's wastewater treatment works by two thirds and doubled pumping station capacity. The town's sewer network was improved, with additional piping and innovative re-routing, including a new cross river sewer concealed inside the bridge parapet.

## FLOOD RISK MANAGEMENT

### CURRENT STATUS

North West has adopted an integrated capital investment programme is now in its second year.

Investment of £246m is now being planned over the next five years which will maintain and improve flood resilience across the North West.

Following further flooding in 2012, an additional £120m was made available to the Environment Agency for its Acceleration & Growth Programme. This has enabled important local schemes such as Croston, Northwich, Salford, Rossal & Anchorsholme to be progressed.

The partnership groups which bring together the local authorities, United Utilities and the Environment Agency are instrumental in identifying flood risk and steering investment in a more co-ordinated way. However, despite this progress, more work still needs to be done identifying and protecting our critical assets.

### FUTURE DEVELOPMENTS

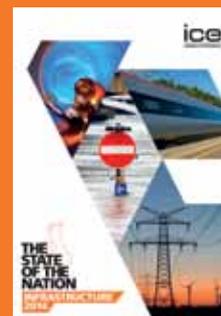
The strategic approach to flood management which has been established over the last two decades needs to be reinforced. This combines flood defences with a holistic management of fluvial and surface water flood risk, and upstream catchment measures to improve building and infrastructure resilience to floods. Flood risk management can be achieved with active measures (physical defences), passive measures (planting of grass and trees to increase water infiltration to soil), emergency management measures (flood warnings and emergency management plans), and improved resilience to speed recovery after flood events occur.

Catchment-wide green infrastructure solutions, especially upstream, offer the opportunity to reduce or delay runoff from catchments. These measures can also provide other benefits such as creating/restoring habitats, enhancing biodiversity, capturing carbon, reducing sedimentation and improving water quality. This type of joined-up, longer-term thinking can make a big difference to our flood resilience.

## KEY TO NORTH WEST GRADES

- A** FIT FOR THE FUTURE
- B** ADEQUATE FOR NOW
- C** REQUIRES ATTENTION
- D** AT RISK
- E** UNFIT FOR PURPOSE

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### CONTACT

ICE North West  
 9th Floor St James' Buildings  
 79 Oxford Street  
 Manchester M1 6EG

**t** +44 ((0)151 708 9210

**e** [john.clayton@ice.org.uk](mailto:john.clayton@ice.org.uk)  
[ice.org.uk/northwest](http://ice.org.uk/northwest)

For more information on State of the Nation reports, please contact ICE Public Affairs:

**t** +44 (0)20 7665 2152  
**e** [stateofthenation@ice.org.uk](mailto:stateofthenation@ice.org.uk)  
[ice.org.uk/stateofthenation](http://ice.org.uk/stateofthenation)

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