Infrastructure and Projects Authority

National Infrastructure and Construction Pipeline Analysis

5 December 2016

Reporting to HM Treasury and Cabinet Office

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Foreword

High quality infrastructure drives economic growth, boosts productivity and raises living standards. That is why we placed infrastructure at the heart of the Autumn Statement.

The new National Productivity Investment Fund (NPIF) includes almost £11 billion of additional investment in housing and economic infrastructure over the next four years, as part of £23 billion in high-value investment announced at Autumn Statement 2016. This is in addition to the existing infrastructure spending commitments made at the Spending Review 2015.

The Infrastructure and Project Authority's (IPA's) newly combined National Infrastructure and Construction Pipeline brings together these spending plans with private investment, setting out, for the first time, more than £500 billion of total planned investment in our economic and social infrastructure, of which more than £300 billion will be invested by 2020/21. It is the largest and most comprehensive pipeline the government has produced and will provide greater certainty for investors and the supply chain, as well as helping us to improve our forecast of future skills needs.

We also want to make sure the higher level of spending will be sustained over the long term. That's why we are asking the National Infrastructure Commission (NIC) to plan on the basis that the government will spend 1.0-1.2% of GDP on economic infrastructure between 2020 and 2050.

Not only does this government want to invest more, we want to encourage the private sector to invest and to get more out of every penny spent. The work of the IPA is crucial to improving infrastructure financing and delivery.

The government has also reaffirmed its commitment to the UK Guarantees Scheme (UKGS) keeping it open for an extra five years until at least 2026. So far the scheme has issued £1.8 billion worth of guarantees supporting £4 billion of capital investment in UK infrastructure across 9 projects. Three guarantees have been approved in 2016, highlighting the continued demand for the scheme.

We are also setting up a new Infrastructure Delivery Ministerial Group to oversee the delivery of projects that will lead a review to identify ways the government, working with industry, can improve the quality, cost and performance of our infrastructure. All of these measures will help ensure our infrastructure will be fit for the 21st Century.

David Gauke
Chief Secretary to the Treasury

The Infrastructure and Projects Authority

1.1 The Infrastructure and Projects Authority (IPA) works to ensure the successful delivery of all types of projects across both the government and the private sector, from infrastructure, defence and IT, through to transformational programmes designed to improve efficiency and transform the way government interacts with citizens.

1.2 To ensure the successful delivery of all types of projects, the IPA:

- oversees policy on infrastructure delivery, finance and Public Private Partnerships
- deploys expert commercial, financial and delivery support
- tracks project performance and manage independent project assurance
- develops useful standards and tools, such as the Project Initiation Routemap
- supports the project delivery and project finance professions
- delivers finance schemes such as Private Finance 2 and the UK Guarantees Scheme

1.3 The IPA is led by its Chief Executive, Tony Meggs, and reports to HM Treasury and the Cabinet Office.

1.4 As the National Infrastructure Commission identifies our long term infrastructure needs, the Infrastructure and Projects Authority ensures these are translated into successful delivery. Together both organisations establish the right framework for a comprehensive approach to infrastructure.

Overview

2.1 The new consolidated National Infrastructure and Construction Pipeline brings together and updates the previous separate infrastructure and construction pipelines.[1] The merging of these two pipelines builds on the work of the National Infrastructure Delivery Plan, which set out the government's plans to support the delivery of housing, and social and economic infrastructure. It will enable Britain to better plan for future skills and resource needs, increase market confidence, and support industry to invest and allocate resources effectively. The pipeline also allows for skills and resource planning. For example, in 2015, the government published the National Infrastructure Plan for Skills using the infrastructure pipeline to model employment, skills and potential training demand.[2]

2.2 The National Infrastructure and Construction Pipeline is a forward-looking assessment of the planned investment in infrastructure across the public and private sectors. It contains over 700 projects and programmes with a total value of more than £500 billion. Table 1 sets out the value and number of projects and programmes in each sector.

2.3 This means the pipeline will, for the first time, bring together details of investment in housing, social infrastructure projects and programmes (for example, in education, health and justice) and economic infrastructure sectors (energy, flood defences, science and research, transport, water and waste).

2.4 The pipeline predominantly includes large capital projects and programmes above £50 million in value, though in some instances, smaller projects and programmes are included. Programmes are made up of two or more projects that contribute to achieving the same objective, such as Transport for London's New Tube for London programme. Often these are rolling investments, such as in the national Catapult centres, creating a network of world leading research technical facilities.

2.5 The publicly funded elements of the pipeline represent announced projects and programmes but the publication of the pipeline does not represent a commitment to undertake all the projects and programmes shown. In privately funded sectors, the decision to go ahead with individual projects will be determined by the market. The pipeline for regulated sectors is consistent with agreed regulatory settlements.

2.6 The IPA will continue to produce regular updates to the pipeline, working with public and private clients to refine and expand the pipeline to better reflect planned spending. The IPA has

1 The pipeline is published on the Infrastructure and Projects Authority website: https://www.gov.uk/government/publications/national-infrastructure-and-construction-pipeline-2016

2 'National Infrastructure Plan for Skills', Infrastructure UK, September 2015.

also begun to work with regional organisations to promote the development of regional pipelines and better reflect regional data in the national pipeline.

2.7 The pipeline will inform a Funding and Finance Supplement to the National Infrastructure Delivery Plan. The IPA will separately publish the supplement setting out the fundamental role played by the private sector in financing and delivering infrastructure.

Table 1 National Infrastructure and Construction Pipeline, by sector

Sector	Number of projects	Number of programmes[3]	Total value (£ million) 2016/17 to 2020/21	Total value (£ million) Total Pipeline
Communications	1	7	15,528	15,546
CPS	0	2	14	14
Education	0	20	22,488	22,488
Energy	96	18	78,624	206,264
Flood	7	22	2,721	4,138
Health	13	19	2,886	2,943
Home Office	0	6	73	73
Housing and Regeneration	5	13	12,916	12,916
Justice	1	43	1,528	1,528
Ministry of Defence	38	9	5,780	8,374
Police Forces	10	19	1,239	1,257
Science and Research	18	7	5,912	6,178
Transport	123	128	91,929	138,331
Utilities	20	76	59,213	74,812
Waste	7	0	538	538
NPIF 2021/22	0	1	–	7,000
Total	**339**	**390**	**301,388**	**502,399**

Alasdair Reisner, Chief Executive of the Civil Engineering Contractors Association (CECA):

“CECA welcomes the publication of the ‘National Infrastructure and Construction Pipeline’, which provides much-needed visibility of forward work for our members.

“If the UK infrastructure sector is to plan for the investment in skills and innovation that will be required to deliver world-class infrastructure in the coming years, it is vital that companies are able to strategically allocate funding on a basis of projected need.

“The pipeline is a crucial tool that enables companies to plan ahead and deliver optimal outcomes for clients, taxpayers, and communities.”

Nick Baveystock, Director General of the Institution of Civil Engineers (ICE):

“Infrastructure services enable balanced economic growth and thriving communities. This updated National Infrastructure and Construction Pipeline sets out the value of infrastructure to the economy and provides long term visibility to industry. ICE welcomes the Government’s commitment to infrastructure delivery and we look forward to the National Infrastructure Commission’s strategy in 2017.”

3 Includes unallocated capital spend.

In 2010, the government produced the country's first-ever National Infrastructure Plan, setting out the government's vision for major infrastructure investment in the UK. In March 2016, it published the National Infrastructure Delivery Plan (NIDP), setting out its plans to support the delivery of infrastructure to the end of the Parliament. Alongside the NIDP, the government published the Government Construction Strategy, which sets out how the government will improve productivity, and become a better client through securing good quality and better value for money in all our construction projects.

Since 2011, these documents have been underpinned by separate infrastructure and construction pipelines which have provided details of current and future projects. The most recent iteration of the National Infrastructure Pipeline, published in March 2016, provided details of over £425 billion of public and private investment in economic infrastructure sectors (energy, communications, flood defences, science and research, transport, waste and water) to the end of the Parliament and beyond. Alongside this, the Government Construction Pipeline set out £163 billion of planned government funded construction projects, supporting industry to invest and allocate resources more effectively.

Changes since March 2016

3.1 Each publication of the pipeline represents the latest available data. Completed projects are removed from the pipeline and new projects are added once they have been announced. Since the infrastructure and construction pipelines were last published, in March 2016, more than 20 projects and programmes have been completed and therefore removed from this version of the pipeline. These include major public investments, such as the £753 million Francis Crick Institute in London, as well as projects delivered by the private sector, including the £620 million Carrington power station.

3.2 This builds on the government's record since 2010: around 3,000 individual infrastructure projects have been completed, providing, for example, superfast broadband to more than 4 million premises; more than 20GW of new electricity generation capacity and better flood protection for over 295,000 homes. The IPA will provide more details about the delivery of the pipeline with annual updates to the National Infrastructure Delivery Plan, beginning in 2017.

3.3 The government is pushing ahead with transformative projects such as Hinkley Point C, which will provide 7% of the UK's electricity needs and create 25,000 jobs during the construction phase, and HS2, which will connect eight of Britain's ten largest cities and, once open, support a further 100,000 jobs in the wider economy (70% of them outside of London).

3.4 More than 20 schemes have been added to the pipeline since March 2016, including the Oxford to Cambridge Expressway, announced at Autumn Statement 2016.

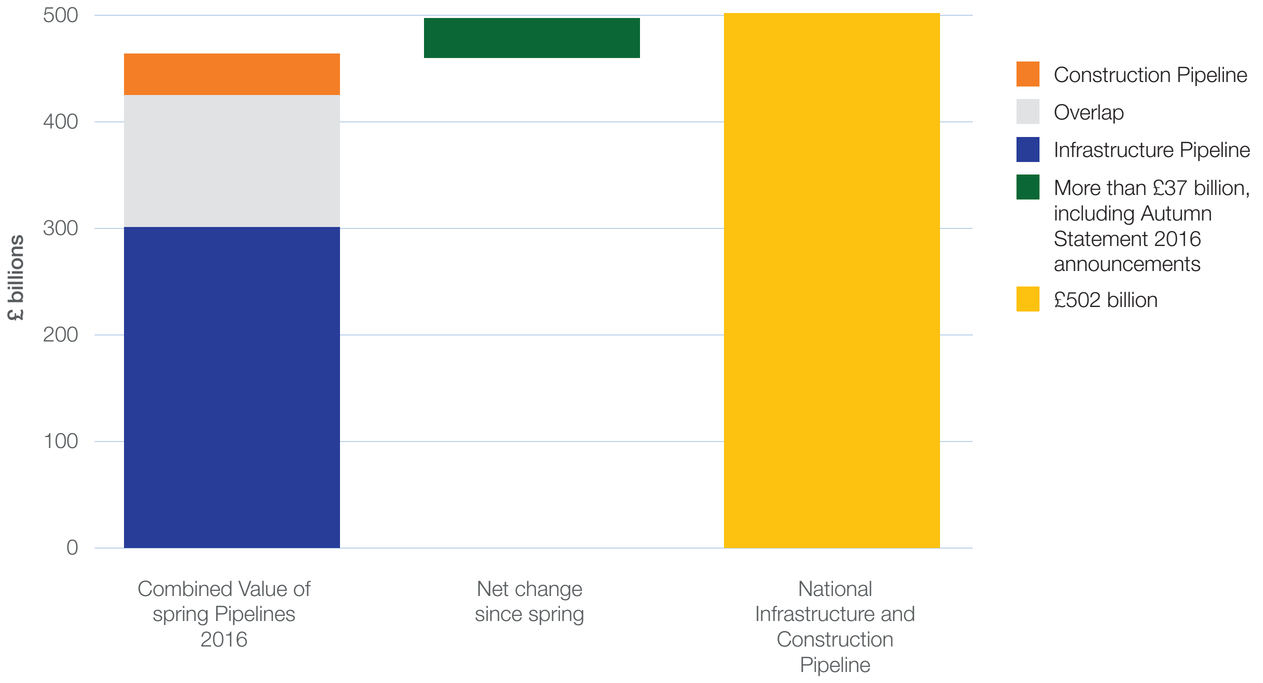
3.5 As the pipeline represents current investment plans, while data on spending from the last tax year (2015/16) is provided in the pipeline for reference, it is not included in the total value of the pipeline, nor in the sector-specific values presented.

3.6 The total value of the spring 2016 infrastructure and construction pipelines was £464 billion, after correcting for the 293 projects (worth £124 billion) counted in both pipelines. These projects have only been included once in the National Infrastructure and Construction Pipeline; therefore the previously overlapping investment of £124 billion has been removed from the combined pipeline. The main changes from the spring pipelines are set out in Chart A.

3.7 The net increase in the value of the pipeline since spring 2016 is more than £37 billion.[4] This includes £10.5 billion of extra economic infrastructure and housing investment over the next four years announced at Autumn Statement 2016.

4 This includes £7 billion National Productivity Investment Fund (NPIF) spending in the year 2021/22 which will be allocated in due course, as per the Autumn Statement 2016 announcement. As with funding already committed, the Devolved Administrations will receive Barnett consequentials in the usual way when future allocations are determined.

Chart A: Changes to pipeline since spring 2016



3.8 The pipeline contains the additional £10.5 billion of public investment in economic infrastructure and housing, as well as other measures, announced at Autumn Statement 2016 over the next four years. This includes:

- A new £2.6 billion package to improve our transport networks, enabled by the new National Productivity Investment Fund (NPIF), including £1.3 billion for roads and local transport networks and £390 million for low emission and driverless vehicles
- A £5.3 billion housing investment package. This additional spending on housing means that the government now expects to more than double, in real terms, its annual capital spending on housing over the course of this Parliament. This new funding includes a £2.3 billion Housing Infrastructure Fund funded by the NPIF that will deliver infrastructure to support the delivery of up to 100,000 homes and an additional £1.4 billion funded by the NPIF investment in affordable housing to deliver 40,000 new affordable homes
- Over £1 billion that the government will invest in digital infrastructure by 2020-21, including £400 million for a new Digital infrastructure Investment Fund, at least matched by private finance, to invest in new fibre networks over the next four years, helping to boost market ambitions to deploy full-fibre access to millions more premises by 2020.

3.9 Where this additional public investment has been allocated to specific projects and programmes, these are set out in the pipeline. In instances where public investment has yet to be allocated to specific projects or programmes within sectors, this has been accounted for in the pipeline sector summary and the total value of the pipeline.

ADDITIONAL SPENDING AT AUTUMN STATEMENT 2016

More than £5.3 billion of investment, including £2.3 billion, funded by the National Productivity Investment Fund (NPIF), in a new Housing Infrastructure Fund that will deliver up to 100,000 homes, an additional £1.4 billion from the NPIF to deliver 40,000 new affordable homes and £1.7 billion through the NPIF in a programme of Accelerated Construction to deliver homes more quickly on public land

£1.3 billion for roads and local transport schemes, including £220 million to fix congestion at pinchpoints on the strategic road network

£450 million to trial digital signalling, allocated from the NPIF to increase capacity and reduce disruptions, and funding for the rollout of smart ticketing technology in the UK’s major cities

Over £1 billion in digital infrastructure by 2020/21, including £400m for a new Digital infrastructure Investment Fund, at least matched by private finance, to invest in new fibre networks over the next four years, helping to boost market ambitions to deploy full-fibre access to millions of more premises by 2020

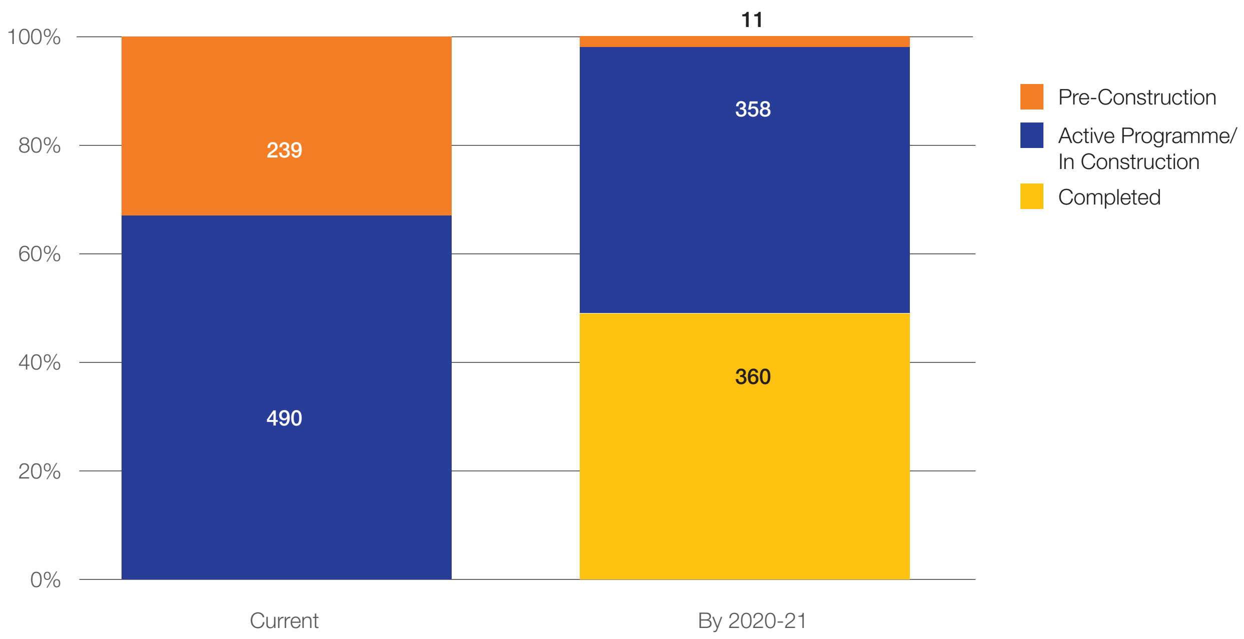
£390 million from the NPIF to support future transport, including £100 million to establish new driverless car infrastructure, £80 million in electric vehicle charging infrastructure and £150 million for low emission buses and taxis

Status of projects and programmes

4.1 The pipeline reflects the latest data available and it will develop throughout the Parliament as new projects and programmes are added and others complete and are removed. More than 60% of projects and programmes in the pipeline are either in construction or part of an active programme. Around half of projects and programmes in the pipeline are expected to be completed by 2020-21; 238 of these are the government's priority projects identified in the NIDP and 22 of these schemes, such as HS2, are included in the Government Major Projects Portfolio (GMPP).[5]

4.2 Chart B shows the status of projects and programmes in the current pipeline and their projected status by the end of 2020/21. It does not include all projects and programmes in the pipeline because some schemes do not have confirmed start or completion dates.

Chart B: Project status, current and projected



5 The GMPP contains the government's largest and most challenging projects and programmes, including infrastructure, IT and transformation. It covers around 150 major projects with a whole life cost of nearly £400 billion.

Sector breakdown

5.1 The pipeline combines projects and programmes across housing, and economic (for example, transport, energy, digital communications) and social (for example, education, justice) infrastructure. In total, the pipeline includes 15 sectors.

5.2 The three sectors with the highest level of investment to 2020/21 are transport (£92 billion), energy (£79 billion) – of which nearly half is made up of electricity generation – and utility networks (£59 billion). Together, these three sectors make up more than three quarters of the total value of the pipeline to 2020/21.

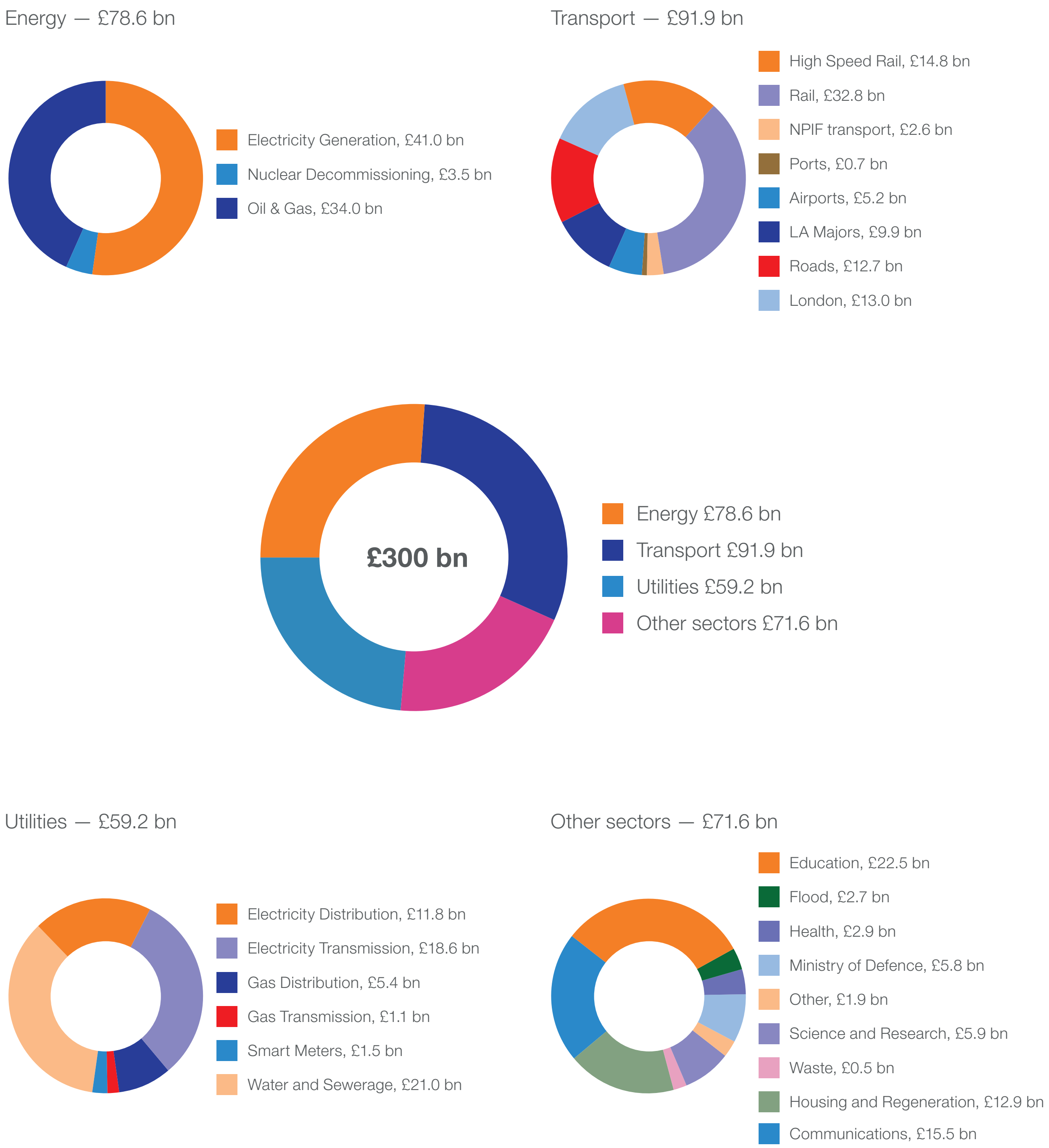
5.3 Of the £92 billion of transport investment in the pipeline to 2020/21, more than £20 billion will be invested in roads and nearly £15 billion in high speed rail. Autumn Statement 2016 set out an additional £2.6 billion of transport spending, including £127 million to build a new expressway from Oxford to Cambridge and to accelerate the construction of East-West rail.

5.4 Whereas electricity and gas transmission, as well as the rollout of smart meters, were included in the energy sector in the March 2016 infrastructure pipeline, they are now included in the nearly £60 billion investment in the utilities sector because these schemes are associated with the regulated utilities programmes.

5.5 Of the £71 billion in the pipeline in the remaining 12 sectors, there is currently £47 billion of investment in social infrastructure, defence and housing to 2020/21, including more than £20 billion in education and £3 billion of projects and programmes in health, from the £24 billion announced at Spending Review 2015.

5.6 Chart C sets out the scale of investment in each sector.

Chart C: Overview of total investment from 2016/17 to 2020/21



INVESTMENT IN KEY SECTORS

£140 billion of investment in electricity generation across the whole pipeline (£41 billion to 2020/21), including Hinkley Point C and the Snetterton biomass plant

£8 billion of investment in defence infrastructure (£6 billion to 2020/21), including the renewal of HMNB Portsmouth, due to complete 2026/27

£6 billion of investment in science and research to 2020/21, including the Sir Henry Royce Institute for Advanced Materials and the New Polar Research Vessel, RRS Sir David Attenborough

The government has already invested £18 billion since 2010 in the school estate and has committed a further £23 billion to 2020/21 so children are taught in facilities fit for the 21st century, giving them the best possible chance to fulfill their potential

£4 billion of investment in flood defences (nearly £3 billion to 2020/21), including the Calder Valley and Leeds Phase 2 flood defence schemes

Funding mix of the pipeline

6.1 The UK has developed a mixed model to fund and finance its infrastructure, using both public and private investment to deliver infrastructure as efficiently as possible.

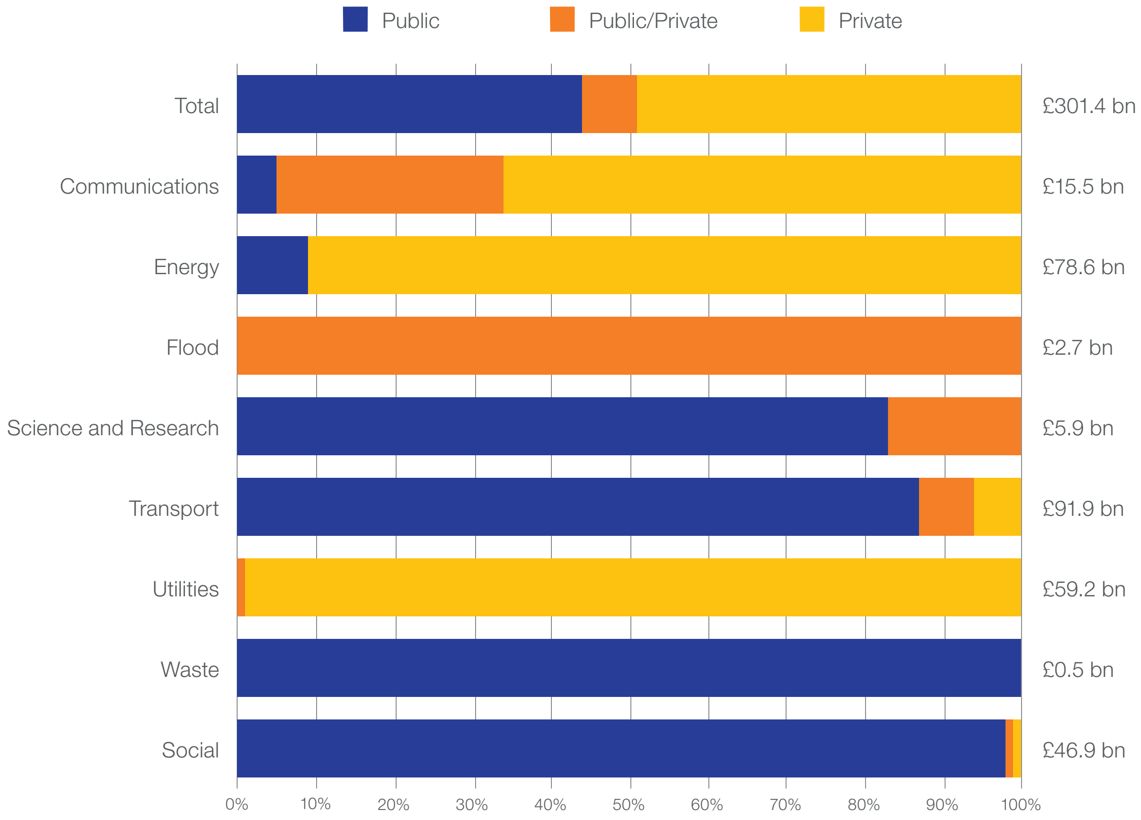
6.2 Our infrastructure is ultimately paid for (funded) through consumer bills, user charging, public funds from taxation or a combination of these mechanisms. These sources provide the revenues that ultimately cover the costs for construction, operation and maintenance, but upfront capital investment (finance) is needed to get projects underway. This finance can be provided through public or private sources, or a combination.

6.3 The three key sources of infrastructure finance in the UK are the government and wider public sector, private companies who finance infrastructure projects on their balance sheets and project finance for specific infrastructure assets.

6.4 Over 50% of the pipeline to 2020/21 is financed and delivered by the private sector, of which 60% is in the regulated sectors. The government also uses private finance to deliver public assets, where this provides value for money, through the Private Finance 2 (PF2) model, a form of contracting that transfers the risk associated with the cost of construction, and long term maintenance of an asset, to the private sector. To ensure the efficient financing of infrastructure, the government is exploring a new pipeline of projects that would be suitable for delivery through the PF2 scheme, which will be published in early 2017.

6.5 Chart D sets out the funding split of each sector of the pipeline to 2020/21. Around half of the pipeline to 2020/21 is made up of public funding, including more than three quarters of transport spending. Most of the investment in the energy and utilities sectors is made up of private funding. Around 7% of the pipeline to 2020/21 is funded by a combination of public and private money. For example, the Environment Agency's £2.3 billion six-year flood defence programme to 2021 is based on a partnership funding model, which encourages private investment.

Chart D: Funding mix from 2016/17 to 2020/21



Regional analysis

7.1 The pipeline contains projects and programmes distributed across the UK but the majority of the value of the pipeline relates to spending in England. This is because most infrastructure spending in Northern Ireland, Scotland and Wales is the responsibility of each devolved administration, and therefore is not included in this pipeline.

7.2 The split between the responsibility of the UK government and each of the devolved administrations for infrastructure policy and funding varies according to the distinct devolution settlement in place, as set out in the National Infrastructure Delivery Plan.[6] Each devolved administration produces its own infrastructure plan setting out spending in economic infrastructure:

- The Northern Ireland Executive published an Investment Delivery Plan for Roads and Regional Strategic Transport Network Plan[7]
- The Scottish Government published an Infrastructure Investment Plan with a Project Pipeline[8]
- The Welsh Government published an Infrastructure Investment Plan with a Project Pipeline[9]

7.3 Infrastructure can help to unlock the economic potential of regions, supporting growth and strengthening productivity by providing greater connectivity within and between regions. While infrastructure projects can support the local economies in which they are physically located, they can also benefit other regions through the creation of supply chain jobs. For example, more than 60% of suppliers for Crossrail are currently based outside of London.[10]

7.4 Around 40% of the value of projects in the pipeline to 2020/21 has been allocated to individual English regions. The remaining 60% cannot accurately be allocated to an individual region because it relates to schemes that cover multiple regions or programmes that will be spread across the whole country (such as HS2 or the rollout of smart meters). It is therefore very difficult to offer a meaningful regional breakdown of infrastructure investment. The following diagram sets out the number, and examples, of projects and programmes allocated to individual English regions, as well as national schemes.

6 'National Infrastructure Delivery Plan', Infrastructure and Projects Authority, March 2016, p. 82.

7 Investment Delivery Plan for Roads', Northern Ireland Department for Infrastructure, July 2015.

8 'Scotland Infrastructure Investment Plan', Scottish Government, December 2015.

9 'Wales Infrastructure Investment Plan', Welsh Government, June 2015.

10 'National Infrastructure Delivery Plan', Infrastructure and Projects Authority, March 2016

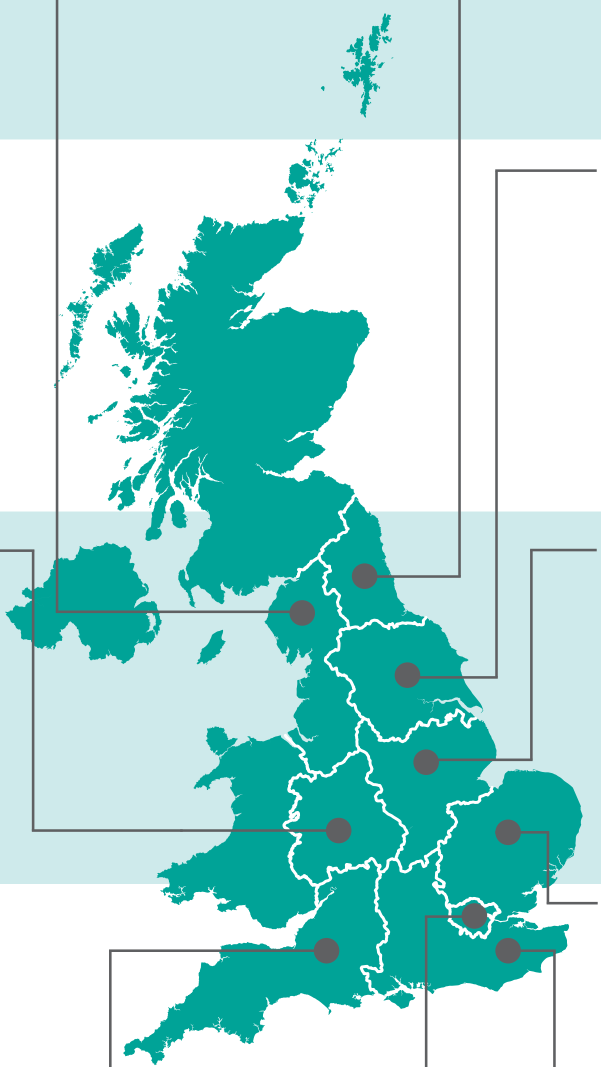
KEY PROJECTS AND PROGRAMMES IN ENGLISH REGIONS

North West – 104 projects and programmes, including:

- Mersey Gateway Bridge
- Manchester Airport investment
- A5036 to Port of Liverpool

North East – 38 projects and programmes, including:

- A1 North improvements
- Sunderland New Wear Crossing
- MGT Teesside biomass plant



National – projects and programmes, including:

- Priority School Building Programme
- Smart meters programme
- Superfast Broadband Rollout Programme Phase 1 and 2
- High Speed 2

Yorkshire and the Humber – 33 projects and programmes, including:

- Leeds Phase 2 Flood Alleviation Scheme
- Hull Energy Works
- Drax biomass plant

West Midlands – 56 projects and programmes, including:

- BH Energy Gap Walsall
- M42 junction 6
- Midland Mainline electrification

East Midlands – 36 projects and programmes, including:

- Lincoln Eastern Bypass
- A38 Derby junctions
- M1 junctions 13 to 19

East of England: 49 projects and programmes, including:

- A14 Cambridge to Huntingdon road improvement
- New river crossings at Ipswich and Lowestoft
- Luton Airport development

South West – 44 projects and programmes, including:

- Hinkley Point C
- Bus Rapid Transit (BRT) – Bristol
- A303/A30/A358 corridor

London – 69 projects and programmes, including:

- Crossrail and Crossrail 2
- Thames Tideway Tunnel
- Thameslink – Network Rail

South East – 90 projects and programmes, including:

- Thames Estuary
- Ebbsfleet Garden City
- Smart Motorways on M3 junctions 2 to 4A and M4 junctions 3 to 12