

# **ENERGY SECTOR SKILLS: A Skills Plan for New Anglia**

**Putting skills at the heart of building  
a competitive and sustainable  
local economy**

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## **Background Context**

The Energy Sector Skills Plan has been developed with the Energy sector in Norfolk and Suffolk, working alongside the New Anglia Local Enterprise Partnership, the New Anglia Skills Board and supported by SkillsReach.

SkillsReach was contracted to facilitate and prepare eight sector skills plans for the New Anglia LEP priority sectors. The project was commissioned by the Education and Skills Funding Agency, in partnership with New Anglia LEP, and funded through the European Social Fund. Each Sector Skills plan and supporting Data Pack has been developed in collaboration with local employers and other stakeholders.

The Sector Skills Plan has been developed in partnership with a number of local Energy stakeholders including major suppliers to the Energy Industry located in New Anglia, EDF Energy, Vattenfall, ScottishPower Renewables, EEEGR, ECITB, UEA and the New Anglia FE College Group.

The New Anglia Skills Board places employers at the centre of decision making on skills in Norfolk and Suffolk to ensure the skills system becomes more responsive to the needs of employers, residents and the future economy.

SkillsReach is an established East of England-based strategic skills consultancy with an associate project team with extensive experience of developing skills plans.

## Introduction

The East of England Energy Zone is unrivalled in the UK for its unique mix of gas and oil, offshore renewables and nuclear energy production. It is a truly global, all-energy sector with 50 years' experience and expertise that provides us the opportunity to nurture innovation between sectors, promote transferability for these combined competencies and support the development of the world's largest windfarms.

The country faces a significant challenge: to replace its ageing capacity, provide power to the nation's homes and businesses and ensure that the nation's lights do not go out. In rising to that challenge, we also have the opportunity to create economic growth, to rebalance the economy towards the regions and in favour of engineering and manufacturing and to attract inward investment. Nowhere is there a greater opportunity to do that than in East Anglia, which is already a significant player in the energy sector, with 35% to 45% of the nation's gas supply coming through the Bacton terminal, where the Sizewell C nuclear power station will be built and with Lowestoft lying closest to the East Anglia Array, potentially the world's largest wind farm.

The Energy sector Skills Plan for New Anglia has been developed by both the public sector and the energy industry in the East. It is essential that employers play a full and supporting role in delivering the identified priority actions. Investing in skills and people is of paramount importance. We need to improve our skills base to serve the large demand that will come from the Southern North Sea in the next few years with regard to the oil and gas and wind sectors and nuclear new build programme. If we do not do that, businesses will source that expertise from other countries. With your support we will deliver this collective vision for skills development across New Anglia and deliver on the potential growth of our Energy Coast.

Peter Aldous

Member of Parliament for Waveney

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## Introduction

The New Anglia Local Enterprise Partnership (LEP) has sponsored the development of an Energy Sector Skills Plan for the New Anglia area. The sector is defined as being a key economic sector for the New Anglia economy. Across the area there is global all-energy expertise with 50 years' expertise in the oil and gas sector, and the world's largest wind farms in development off the coast, with a globally competitive renewables supply chain and support industry.

The East of England Energy Zone is unrivalled in the UK for its unique mix of wind power, gas and nuclear energy production. The supply chain has decades of experience and expertise, recognised with Enterprise Zone status. The coast around Great Yarmouth and Lowestoft is at the centre of the world's largest market for offshore wind. Furthermore, capital investment in energy worth £50bn is planned for the region by 2020, with the world's largest wind farm in development off the coast and the proposed development of Sizewell C nuclear power station creating 25,000 jobs.

### What A Skills Plan Is For

Skills Plans are being produced in response to our recognised key employment sectors for Norfolk and Suffolk. The purpose of a skills plan is to ensure that businesses within these sectors are able to benefit from an appropriately skilled, productive and readily available workforce. We recognise how important the quality of the workforce is for business competitiveness and for creating sustainable jobs and careers. Previous plans have been produced for Health and Social Care, Digital Technologies and Construction.

The skills plan aims to create a **social partnership programme** between the Energy sector's industries and the relevant organisations that target and deliver support across the areas of New Anglia that experience relatively high levels of economic and social deprivation. The planned interventions aim to deliver lasting change for these areas by ensuring relevant training and sustainable employment is made accessible to New Anglia's working age residents. Furthermore, that positive connection with education is in place to inform, inspire and secure the next generation of the Energy Sector workforce.

The skills plans capture meaningful action to make a difference. For this- Energy Sector Skills Plan, we have captured the following key priorities:

- i. **Mobilising Industry Leadership-** the plan explains the importance of developing and securing a sustainable private sector led approach, overseeing skills development and investment;
- ii. **Developing a higher technical engineering offer-** feedback from employers has highlighted the need for a better supply of local, graduate level, mechanical and electrical engineering skills.

- iii. **Building ‘intra-industry’ and ‘inter-sector’ workforce transferability-** feedback from employers highlighted the need to enable businesses within the Energy sector to access skills and workers locally from other industries at key times, as much of their requirements are generic.
- iv. **Addressing overall ‘Energy Skills Fragility’-** employers are aware of jobs and key functions that experience skills shortages. We have defined these as fragile areas that require an appropriate training response, accessible to learners and employers across all of New Anglia.
- v. **Building Inclusive Local Capacity & Securing the Future Energy Workforce -** there are a number of pressure points and key concerns identified linked to the future supply of employees into the sector overall. We have identified a series of actions to engage with schools, open up opportunities to move into jobs within the Energy sector and address imbalances in the workforce linked to age and gender. In addition, the sector often looks externally out of area to for its labour supply, it is important to work with employers to tackle the barriers that inhibit the growth in local residents securing employment in the Energy sector.
- vi. **Apprenticeships and Group Training-** Given the implementation of the apprenticeship levy- there should be a more coordinated approach to gather and deliver apprenticeships linked to employer needs. This plan sets out steps to create a more cooperative approach towards delivering suitably trained apprenticeships.

The skills plan expands these six priorities as key interventions- demonstrating the evidence, defining the rationale, clarifying the action, leadership, timing and support resources- for delivery.

## Overview of the Energy Sector

**New Anglia's Energy Sector is internationally significant, with major operational energy infrastructure assets and planned infrastructure development across the key industries of Offshore Wind, Oil and Gas, Nuclear and Low Carbon Renewable Energy.**

The unique combination of geographical phenomena, established, deep rooted expertise and investment spanning over 50 years- has helped shape a world leading energy presence. At an aggregate level New Anglia's combined energy output plays a pivotal role in securing the UK's ongoing energy demands; an output that is set to grow significantly throughout the 21<sup>st</sup> century. Furthermore, the combination of development, expansion of existing assets and decommissioning programmes- draws together a sector of significant economic value and market opportunity; supported by extensive, high quality, supply chains.

### Offshore Wind

The UK has been the world leader for offshore wind for almost a decade. The energy industry infrastructure in place through the oil and gas markets, along with the unique environmental and geographical phenomena along the Southern North Sea, has enabled the offshore wind industry to agglomerate and precipitate a rapid plan of further wind farm development. In 2017 Cambridge Econometrics reported that by 2032, the total amount of direct employment in the UK offshore wind sector could be in the region of 21,000 FTE jobs. Currently there are 10,000 FTEs jobs in the sector, however taking into account indirect and induced employment relating to the industry, it could result in an additional 37,000 FTE jobs by 2032. They report that the bulk of employment is expected to be along the east coast of England.<sup>1</sup>

The Offshore Wind Sector is working collaboratively at a national level with the UK Government to develop a Sector Deal that transforms people, places and power across the UK<sup>2</sup>. A key milestone in achieving this transformation is deploying up to a cumulative total capacity of 30GW of offshore wind by 2030. National analysis<sup>3</sup> is helping to benchmark the required energy output target against GDP and job creation targets, giving an overarching business case for infrastructure investment, and thus a catalyst of labour and skills demand on a long-term basis. This will unlock the investment that will drive a step-change in increased productivity, export opportunities and the growth of a skilled and diverse workforce around the UK.

The East of England coast plays host to nearly 70% of the total capacity installed in UK waters. A summary below captures the key offshore wind developments, highlighting the overall significance of the operational and planned wind farm infrastructure for New Anglia:

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<sup>1</sup> Cambridge Econometrics- Future UK Employment in the Offshore Wind Industry (2017)

<sup>2</sup> RenewableUK- Offshore Wind Overview- Sector Deal Summary (2018)

<sup>3</sup> BVG Associates- Mapping Offshore Wind Target Supply

- **Dudgeon (Dudgeon Offshore Wind Ltd (a subsidiary of a business consortium which includes Statoil))-** a fully commissioned wind farm generating an optimum 402 MW, located 32 km north of Cromer on the Norfolk coast. The onshore connection to grid is located at Necton.
- **Greater Gabbard (SSE majority) -** a 504MW output operational wind farm installed on sand banks 23 km off the Suffolk Coast.
- **Scroby Sands (Powergen Renewables) -** an operational wind farm located 2.5 km off the coast from Great Yarmouth, Norfolk, with an estimated 60 MW output.
- **Sheringham Shoal (Statoil majority owned) -** a 317 MW operational wind farm spread of 35 km<sup>2</sup> located 17 km from the Sheringham coast in Norfolk.
- **East Anglia One and East Anglia One North (ScottishPower Renewables)-** East Anglia One is currently under construction and East Anglia One North is in the assessment process, combining for a 209 km<sup>2</sup> offshore wind zone, profiled to generate up to 800 MW in energy- located 36 km off the coast from Lowestoft;
- **East Anglia Two (ScottishPower Renewables)-** at the early stage assessment process for a 205 km<sup>2</sup> offshore wind zone, profiled to generate up to 900 MW in energy- located 31 km off the coast from Lowestoft;
- **East Anglia Three (ScottishPower Renewables)-** consent was given in August 2017 for the development of a 305 km<sup>2</sup>, 172 turbine wind farm that is expected to generate up to 1200 MW of electricity when fully operational. The infrastructure scope will include up to four offshore collector stations and up to two offshore converter station platforms. Up to four subsea export cables will be laid to transmit electricity from the offshore platforms to shore, with anticipated interconnector cables between the further planned farms- at East Anglia ONE and East Anglia THREE. Landfall is sited at Bawdsey with onshore transition pits to join the offshore and onshore cables and up to four onshore underground cables pulled through existing ducting to be laid by East Anglia ONE, running for approximately 37 km from landfall to the connection point at Bramford, Suffolk, with jointing pits, to transmit electricity to a new onshore transformer substation. An onshore transformer substation at Bramford, Suffolk, to connect the offshore wind farm to the National Grid will also be built.
- **Norfolk Vanguard (Vattenfall) -** a 1.8 GW development proposal classed as a Nationally Significant Infrastructure Project (NSIP) under the 2008 Planning Act. The proposed wind farm will be located 47km from the Norfolk Coast and Vattenfall has accepted National Grid's connection offers for Norfolk Vanguard based on an onshore connection point at the existing 400kV Necton National Grid Substation.
- **Norfolk Boreas (Vattenfall) -** a 1.8 GW 'sister project' development proposal also classed as a Nationally Significant Infrastructure Project (NSIP) under the 2008 Planning Act. As with Vanguard, the proposed 'Boreas' wind farm will be located 47km from the Norfolk Coast and Vattenfall has accepted National Grid's connection offers for Norfolk Boreas based at the existing 400kV Necton National Grid Substation.
- **Hornsea Project Three (Orsted- formerly DONG)-** a pre-application stage proposal from Orsted scoped at a 696 km<sup>2</sup> wind farm installation off the North Norfolk coast, expected to generate up to 2.4GW of electricity.

The total wind farm output once planned infrastructure becomes operational and transmits to grid is expected to be approximately 10.1 GW of combined output, roughly the size of three next generation nuclear reactors.

Employment growth in the sector has been substantial with the industry workforce contributing to the 2,400 workers in New Anglia within the energy production and distributions sub-sector. The increase in automation technology linked to surveying practices (drones, marine surveying) and the advent of next generation turbine technology, is however likely to moderate the employment growth for offshore wind overall.

## **Oil and Gas**

The UK Continental Shelf (UKCS) contains substantial oil and gas reserves (with an estimated 20 billion barrels of oil and gas still yet to recover) and its industry plays a pivotal role in contributing to the UK's security of energy supply. The scale of economic contribution and capital investment outweighs the majority of other economic sectors across the UK- with an estimated £8.3 billion capital investment (in 2016) and £7 billion in operating assets.<sup>4</sup>

Latest estimates show that the UK offshore oil and gas industry supports more than 302,000 jobs. Employment is spread across the country, with almost 60 per cent in England, 38 per cent in Scotland and the remainder across Northern Ireland and Wales. The estimated total employment share for East of England was at 5% (7,500) in 2017. The latest employment estimate is 160,000 lower than the peak of more than 460,000 jobs in 2014, outlining the downturn in the oil market from the contraction of oil prices. The pace of contraction in employment has slowed to 4.2 per cent (2016-17), compared with 15.6 per cent from 2015-16 and 19.4 per cent from 2014-15.<sup>5</sup>

More than 52,000 people travelled offshore in the UK in 2016, back in line with the long-term trend seen before 2012. The core offshore workforce (those spending more than 100 days offshore per year) decreased by 18 per cent from 2014-16, from 28,990 to 23,651. As the UK Continental Shelf (UKCS) becomes more efficient, productivity has improved with a 42 per cent increase in oil and gas production per core offshore worker since 2014. The average age of offshore workers has increased to 42.7 from 40.7 in 2014. Around 15 per cent of the offshore workforce is non-British citizens, around half of whom are from the EU.

New Anglia is an established hub for the oil and gas industry and a large base for major and international businesses. With a large local workforce pool accessible, including established channels for 'importing' contractors and vast relevant experience, the region has maintained its reputation as a national centre for offshore activity.

The Bacton Gas Terminal located on the North Norfolk Coast is one of the six main UK gas terminals which receives gas from the UKCS. Covering an area of 180 hectares its operating terminals are run by Shell, Eni, Perenco, BBL and the National Grid. Bacton is the

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<sup>4</sup> Oil & Gas UK, Workforce Report (2017)

<sup>5</sup> Oil & Gas UK, Workforce Report (2017)

recipient terminal for the GDF Cygnus development which with a £1.4 billion capex is the largest UK gas discovery to be developed in the last 25 years.

The oil and gas supply chain is diffuse and significant in its reach across the region, the UK and internationally. Key supply chain categories include:

- marine and subsea,
- facilities engineering,
- operations and maintenance,
- reservoirs, wells and drilling,
- support services and
- major multi-service contracting.

Gas regularly meets up to 50% of GB's demand for energy, meaning an increasingly important role for gas extraction and transportation activities, given the advances in drilling and fracturing technologies that enable former deeper embedded gas fields to be accessed. Demand therefore for energy production from gas is expected to rise, which further emphasises the exploration, extraction and engineering activities for the gas market.

Many of the structures producing oil and gas have a limited lifespan, often 25-40 years, and an increasing number are due to be taken out of service. When redundant, they must be removed and disposed of, ensuring that the surrounding area is safe from environmental contamination. Decommissioning has become a major business within the oil and gas industry and is a lengthy and high cost operation. Decommissioning of existing North Sea oil and gas facilities is projected to cost £24-36bn over the next 30 years.

There is however a recognised renaissance in gas production across the Southern North Sea area, with advancements in drilling technology and recovery techniques enabling a previous 'mature'/late-life gas industry and infrastructure to benefit from higher yields and market efficiencies.

## **Nuclear Power- Investment Overview**

Energy companies are currently planning to build up to 19GW of new nuclear power capacity in the UK, with the first new reactors expected to be operational in the mid-2020s.

It is estimated that this new generation of nuclear power stations will require a total investment of at least £70 billion.<sup>6</sup> The UK currently has 15 reactors with a total generating capacity of 10 GW of electricity. These stations generate around a fifth of the UK's electricity – however they are all scheduled to be retired by 2030. The exception is Sizewell B located in Suffolk, the UK's only pressurised water reactor (PWR), which began operations in 1995.

The nuclear new build programme for the UK is for five new nuclear plants by 2030, plus a decommissioning programme. This means demand is forecast to rise from 87,560 full time

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<sup>6</sup> Nuclear AMRC New Build Plans (2017)

equivalent staff (FTEs) in 2017 to 100,619 by 2021, requiring a total industry inflow of 7,000 FTEs per year, once replacement demand is considered.<sup>7</sup>

EDF Energy is proposing to build 'Sizewell C' a two EPR reactor (a third-generation water pressurised reactor type) development located north of the existing Sizewell B operating plant, capable of generating enough electricity to power around 5 million homes- 3.2 GW output. EDF Energy considers Sizewell C to be one of the biggest and most technologically complex construction projects ever built in the UK. Its peak operational capability would generate electricity for 60 years and over the lifetime of the construction an estimated 25,000 employment opportunities would be created. At its peak the construction site workforce would be about 5,600 people. Once operational, the new power station would support around 900 permanent jobs. EDF Energy has completed Stage One and Two of its pre-application consultation for the proposed Sizewell C project. In conjunction with the formal planning and community consultation, EDF Energy is advancing plans to formalise its supply chain requirement. An estimated excess of 140 Tier 1 contractors, each planning to deliver multi-million to several billion-pound contracts and each with multiple Tier 2 and 3 supply chain requirements, means the programme opportunities across the construction, manufacturing, engineering, transport and logistics supplier base are significant. EDF Energy is working closely with the Suffolk Chamber of Commerce to coordinate the development of a Sizewell Supplier Database.

### **Nuclear- Current Operational Demands and Decommissioning**

In the East of England EDF Energy also operates Sizewell B power station which employs 575 staff and 250 contracting partners. Sizewell B is scheduled to operate until 2035 but this could be extended by a further 20 years. Sizewell B generates an average of 1.2GW electricity into the national grid via the UK's only pressurised water reactor.

There are further opportunities in nuclear power station decommissioning at Sizewell A, Suffolk and Bradwell, Essex, which could be worth around £3bn to the regional economy. NSA Nuclear model a peak demand forecast of 100,619 FTEs overall nationally for the Nuclear sector of which an estimated 15,000 FTEs will be focused within key decommissioning activity.<sup>8</sup>

### **Low Carbon Renewable Energy**

The UK low carbon and renewable energy (LCRE) economy grew by 5.0% to £42.6 billion in 2016, from £40.5 billion in 2015. Nationally the number of employees working directly in the LCRE economy in the UK grew by 3.3% to 208,000 fulltime equivalents (FTE) in 2016, from 201,500 in 2015. In 2016, almost half (45.8%) of the UK's turnover from onshore wind activities was generated in Scotland (£1.5 billion); by contrast, over 80% (£2.4 billion) of the UK's turnover from offshore wind activities was generated in England.<sup>9</sup>

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<sup>7</sup> Cogent Skills/NSA Nuclear- NSA Nuclear Workforce Assessment (2017)

<sup>8</sup> Cogent Skills/NSA Nuclear- NSA Nuclear Workforce Assessment (2017)

<sup>9</sup> ONS, UK Environmental Accounts: LCRE Survey (2016)

The Office for National Statistics Low Carbon and Renewable Energy (LCRE) Economy Survey found that in England, 83,000 businesses (equivalent to 4.4 per cent of all non-financial businesses in England) were active in the LCRE sectors in 2014. An estimated 201,000 full time equivalents (FTEs) were employed, representing 1.3 per cent of all non-financial FTE employees in England. If we apply these national proportions to the New Anglia economy, then we can estimate that there are approximately 3,000 businesses operating in the LCRE sector employing around 6,700 FTEs (*please note the use of full-time equivalent employees as opposed to employment used for the other high performing and underpinning sectors*).

Given the pre-dominance of traditional industries such as agriculture and manufacturing (with pre-existing skills and knowledge suited to diversifying into the LCRE sector), New Anglia's geography (coastal, with proximity and good access to shallow off-shore sights which are preferred for off-shore wind farms), weather patterns (above average sunshine duration, and below average levels of rain, make solar power an attractive energy source for households and businesses alike), and the presence of the Sizewell Nuclear Reactor mean that these figures for employment and business numbers are likely to be fairly conservative.

New Anglia's LCRE industry is diverse. Given the major agri-tech sector activity, there is a close association between agricultural by-product and waste and a growing bio-energy industry across the area. Research into segmenting the LCRE industry across New Anglia highlighted that for bio-energy there are growing number of micro-generating, farm-based enterprises, with operating anaerobic digestion and biomass activities. These are in essence micro-industries, often involving a small association of farming businesses developing arm's length CIC based or private holdings for micro generation, combined heat and power solutions and output to grid- activity. Larger bio-energy and dedicated AD power plants are more prevalent in Suffolk, with Adnams Bio-energy near Southwold and two dedicated AD plants run by BioCow in the area.

Alongside bio-energy, New Anglia is home to a number of domestic renewable energy service suppliers, accessing a range of renewable heat and energy products and installation solutions from a broader supply base. In addition, there is growing significance across wave, tidal, and marine based energy research and solutions- with Orbis Energy acting as an important incubator and catalyst for research led renewable energy activity.

## Sector Definition

For the purposes of this work we have agreed with the New Anglia LEP to follow their existing definition of the Energy sector, as detailed within the current Strategic Economic Plan (SEP) (2017). This definition focuses on the core elements of activity - oil, gas, offshore wind, onshore wind and renewable technologies and nuclear.

The data analysis has also mapped the relevant SIC codes linked to maritime activity. This is an attempt to capture the element of maritime activity that supports offshore energy developments.

There are three main additional contextual points to clarify in the scoping of the sector overall, to understand the data analysis focus and methodology for employer/stakeholder consultation, these are:

- The definition includes a revised focus on onshore renewable and low carbon activity- to align with the New Anglia LEP's 2017 Strategic Economic Plan. This refers in particular to energy produced through micro-generation renewable technology made available through bio-energy, solar, hydro and energy storage to power. The consultation key findings highlight the importance of aligning the crosscutting issues to take in to account low carbon renewable technology- particularly for key areas linked to STEM skills and engagement with careers and enterprise initiatives- such as engineering and advanced manufacturing;
- Furthermore, the analysis of the economic performance of the sector, including its growth and productivity, employer base, employment size and skills and attainment- focus on the SIC framework developed based on the New Anglia LEP definition. To this end the analysis does not directly include construction and engineering related activity. The consultation however has captured previous research and input from key stakeholders on the significant common areas of activity between these sectors and therefore has made recommendations demonstrating the importance of cross-sector building mobility and flexibility of skills and labour supply. Much of the mapping of the Energy sector that has been performed in the past has taken this broader definition, which allows supply chain data to significantly increase the scale of the Energy sector overall;
- Comparator areas have been scoped based on other nationally significant concentrations of the defined sector as well as closer coastal and nuclear developments. Regional data presented for comparator reasons are based on legacy RDA regional areas rather than the recent devolved LEP regional area definitions.

## Opportunities and Challenges

A range of employer interest groups, employers and key stakeholders were consulted during the process of developing the Energy Skills Plan. Consultation with EEEGR's Special Interest Groups- covering Offshore Wind, Late Life & Decommissioning, Marine Exploration and Southern North Sea Gas Extraction/Rejuvenation- has enabled a detailed picture of the technical advances and market developments to be assessed. In addition, detailed review of relevant national and local research and policy areas has helped position the issues and emerging interventions within a relevant industrial context.

In addition, an employer survey was also disseminated via EEEGR and the Chamber of Commerce to businesses engaged- either primarily or via supply chain activity- to the industries within the sector. In summary, the consultation groups consisted of a combination of semi-structured interviews, direct 1-2-1 consultations and group 'task and finish' group sessions with:

- Energy Sector employers- including Tier 1 clients, Tier 2 OEMs and SMEs within each key industry area and across supply chains;
- Key Industry Stakeholders and Business Representative Groups- including ECITB, EEEGR, NSA Nuclear, CITB, Chamber of Commerce;
- Key partners of interest and influence- the LEP, Local Authorities, industry consultants; and
- Educational Institutes and training providers- including FE, HE and the private training market.

## Employer Feedback

### ***Offshore Wind***

In a strategic context defining and measuring the major offshore wind workforce needs are affected by developments at a national level, particularly the formal processes linked to the planning and approval of the key infrastructure pipeline. The next generation of the offshore programme for New Anglia is set to dwarf the existing operational activity in terms of scale and output and aligns with the strategic importance of position the UK offshore wind industry as the global leader. A key development linked to this is the nascent national Sector Deal programme emerging as a response positioned in the new Industrial Strategy.

The Industrial Strategy presents Sector Deals as a unique opportunity for government and private investment to be balanced across a strategic framework to underpin economic growth and competitiveness. Critically it positions 'people' as one of several strategic themes to frame each Sector Deal- alongside 'ideas', 'infrastructure' and 'business environment'. The Industrial Strategy overall outlines the importance of 'people' within the national economic context, highlighting the investment in STEM skills, new technical route ways and a new National Careers Strategy- as important cornerstones for national and local policy. The Sector Deals already announced, which include construction and life sciences-

two other key sectors for New Anglia- capture how industry will respond through joint ownership and investment with government for measures that include skills development.

Both Vattenfall and ScottishPower Renewables have highlighted their engagement with the national Sector Deal initiative- with collaboration towards an Offshore Renewable Sector Deal. Although at its early stages and with recognition of what is essentially a national competitive process, given New Anglia's scale of activity in this area already key feedback highlights that New Anglia could be positioned as centre of excellence for the Offshore Wind Industry. A specific emphasis on operations and maintenance, given the existing and planned infrastructure and the proximity of other key industries providing a relevant skills and training base- namely oil, gas and nuclear- for New Anglia may act as a catalyst to stimulate a range of supply side priorities including-

- Greater influence over the careers and enterprise programme locally with enhanced private sector involvement;
- More collaboration between employers as a group and HE to inform degree and postgraduate degree technical curriculum, with an added focus on work experience and graduate internship programmes;
- Defining technical vocational route ways, including apprenticeship standards with Tier 1 and OEM industry leading the development of apprenticeship engagement across their supply chains;

Overall the workforce demands for the offshore wind industry are project cycle based –from the planning, consultation stages through to new build, operations and maintenance. Feedback from employers indicates a 3:1 ratio between workforce needs at peak build compared to live running operations. As with other parts of the sector overall this leads to a transient, contractor based, workforce- with around 25% of the overall workforce being permanently employed at the Tier 1 level.

Overall the employers with current operational activity in the area experience a 'polarised' apprenticeship offer due to OEM constraints and the 5-year manufacturer warranty lead out time restricting Tier 1 investment in wind turbine training. Analysis indicated that Level 3 Engineering Maintenance apprenticeship provision was actively used through East Coast College (SSE) for general, performing engineering operational (PEO) roles at turbine base and sub-station (heavy electrical, fabrication etc) activities but dedicated turbine engineering training was either dominated via OEMs internally or out of area training, with the University of Strathclyde cited as an area of expertise in higher technical engineering output.

Employers highlight that recruitment is generally done through national channels, often with contractors being brought in from previous or concurrent national projects. Key skills needs include project management skills linked to heavily oriented project-based work methods. The civil infrastructure investment stages require a mixture of key roles and trade-based skills from across construction and civil engineering, including digging, cabling/piping and onshore new build for power transmission.

### **Low Carbon Renewable Energy (LCRE)**

Key skills needs for this part of the LCRE market includes technical installation and operational training for CHP/biomass/AD kit operation and health safety training linked to environmental hazards from the operating environment, such as toxic methane gases. Training provision in this area is usually provided through non RQF accredited, short, technical training- paid for by the business and delivered through the private training market- often linked to industry representative groups- such as HETAS for biomass and sector skills bodies (e.g. Cogent Skills for AD training through their national training programmes).

Biomass installation usually requires a combination of gas accredited qualifications, combined with working within a 'wet' environment. HETAS provide a direct entry (with NVQ L2/3 pre-requisites) programme for biomass installation, with training available from its approved training centre in Sudbury, Suffolk.

The Solar PV industry is broad and contains a high percentage of sole trader, micro and SME enterprises. There are however an increasing number of enterprises developing a broader renewable solution, that aims to combine solar PV, with solar thermal and biomass/CHP installation. NICEIC approved short courses are the standard training route way for solar PV installation and maintenance, solar thermal and heat pump installation/maintenance activity. The training is delivered nationwide and usually out of the New Anglia region.

Consultation with employers within the energy utility industry has highlighted the growing importance of New Anglia being the home to a number of domestic focused renewable heat and energy service providers. These provide a client focused assessment and consultation service, using approved suppliers of renewable heat and power solutions- air source heating, ground source heating, solar PV and biomass/CHP installations. In addition, there is a growing demand for intelligent sensing solutions to regulate heat, lighting, power output/generation and consumption- linked to plugs, domestic sensor units with digital capture and transmission technologies.

Employers operating in this market require a balance between financial, commercial and technical skills. Understanding the needs of the domestic client and presenting solutions representative of latest industry dynamics and products- requires problem solving and strong relationship management skills. Feedback from employers has indicated that the workforce operating in this area is local and is often sourced from a customer service background, up to a graduate level. There are however no specific courses available linked to the domestic energy market, with apprenticeship route ways usually following a customer service or business administration path.

### **Oil and Gas**

New Anglia is home to some of the bigger international employers that provide installation, maintenance and decommissioning facilities- for Greenfield and Brownfield projects based off the East Coast in New Anglia. The service listings for many of the key employers primarily based in Great Yarmouth and Lowestoft range from well drilling and installation

engineering, through to operational roles, on and offshore logistics, cleaning, marine growth removal, pipe cutting and removing, surveying and decommissioning.

The oil and gas industry has traditionally required a broad engineering skill set across a range of key disciplines: installation, operations and maintenance, through electrical, manufacturing and civil/construction route ways. Overall the industry requires a workforce that has a high level of accredited training (at least to a traditional HNC level/RQF 4) but with the adaptability to be able to specialise for key roles, such as- crane technicians and specialist metering technicians. Several employers expressed the importance of planning 'vertical, horizontal and in-depth skill sets' for oil and gas- to enable a flexible workforce to be able to move horizontally between projects (and often other industries- oil/gas/offshore wind), to provide in-depth capability and develop project management/leadership potential for vertical Tier 1/OEM/supply chain relationship management.

Feedback from employers within the oil and gas installation and maintenance space highlights that there is a paucity of labour supply within instrument technician roles, which bears an increasingly aging (45+) workforce, with contractors often only available out of the area for specific project based cyclical demands. Feedback highlighted that there was a robust 'generic' training offer up to foundation level but there was a lack of higher technical engineering route ways- both via traditional graduate engineering programmes and through vocational training options. Decommissioning and late life work demands increasingly look for specialised technical roles linked to fault finding, niche servicing and operational requirements- and the 'skills offer' lacked a 'deep rooted, working environment, technical discipline'. The feedback overall highlighted the need for a better supply of local, graduate level, mechanical and electrical engineering skills. Furthermore, well plugging and abandonment is a skill set in its own right; as the Southern North Sea (SNS) is one of the first regions to undertake large scale decommissioning there is a real potential to create specialist skills in this sector, which could be exported globally.

In addition, employers highlighted the increasing commercial skills needed to engage with operations and maintenance demands through the primary Tier 1s, OEMs and suppliers- with the importance of financial skills in value chain management- marketing, sales, investment feasibility planning. Furthermore, the advance of gas extraction techniques and marine exploration/surveying technology- employers highlighted the need for the workforce to demonstrate greater transferability of skills between digital, surveying, engineering/manufacturing and maintenance services. Key examples include:

- the transition from CAD to GIS cloud / thin client web-based mapping systems for marine surveying, including an increasing use of drone technology. Surveying practice is becoming increasingly sophisticated through digital and automation technologies;
- the increased importance of drilling and fracturing operations for the extraction of deep bed 'tight' gas;
- delivery of augmented reality/virtual reality techniques and sub-sea diving technology for wind turbine OEM production and offshore wind farm development;
- a generic subset of skills linked to oil decommissioning, gas and offshore- for example survival training, maintenance/service operatives, electrical engineering;

## **Nuclear**

For nuclear- both the ECITB and the NSA for Nuclear emphasise the key point of needing a mobile and flexible workforce. Cogent's Nuclear Workforce Assessment (2017) highlighted the overall skills demands linked to both the new nuclear programme and national decommissioning. Engineering and trade-based disciplines are forecast to represent the most significant skills demands, with a strong emphasis on civil engineering- but it is the pooling of strongly related occupations that is highlighted as critical to meet fluctuating demands:

“The nuclear industry renaissance is taking place against the backdrop of both a large, well-developed decommissioning activity, and a significant defence programme. Large parts of the supply chains are distinct, but equally strong overlaps exist. Whether on different projects within the same sector, or between civil and defence sectors, many of the skills requirements are the same, or similar. It follows that there is great benefit in ensuring that the development and utilisation of skills happens in an efficient and cost-effective manner. Understanding the mobility of skills, and how that knowledge can be applied to the phasing of projects, will be essential in supporting the industry and strengthening those skills currently regarded as fragile.” (Nuclear Workforce Assessment, 2017, NSA Nuclear/Cogent).

The Nuclear Workforce Assessment classifies the skills needs of the nuclear industry into three bands:

- Band1 – subject matter experts equating to 1% of the overall workforce, representing the highly specialised skills for the nuclear industry;
- Band 2- nuclear specific skills equating to 18% of the overall workforce, representing nuclear specialised skills relevant to the industry, for example nuclear safety case engineers; and
- Band 3- generic skills equating to 81% of the overall workforce, which may also be at a higher skilled level but not nuclear specific.

Across the three bands a number of 'fragile skills', highlighting the supply into project resource areas most at risk from poor supply- these include:

- Control and instrument engineers;
- Specialist safety engineers;
- Commissioning engineers
- Electrical engineers; and
- Project and planning control.

Feedback from EDF Energy through the consultation corroborates the national picture reported by NSA/Cogent. Overall, New Anglia requires a workforce development programme for Nuclear that can enable the cross-referral to and from other key industries within the Energy sector and other relevant sectors in the local economy- namely construction and manufacturing. This allows a more resilient and flexible response towards the changing cyclical demands, which recognising the upturn in the new Nuclear

programme, alongside offshore infrastructure development against the supply of key trades and roles within construction and horizontal workforce 'virement' from oil and gas.

### ***Cross-cutting Issues***

**Energy-Construction-** data evidence and feedback from employers/stakeholders highlights that the relationship that the Energy sector has with Construction is the most prominent crosscutting issue. The onshore construction linked to the offshore wind combined with the new nuclear programme will create a massive increase in construction related roles and functions over the next ten years for New Anglia. Planning effectively for upscale and downscale stages, skills and labour supply will become critical elements to ensure the benefits of the investment are maximised for the local area. Civil engineering disciplines can also be attributed to demands linked to onshore infrastructure development for energy to grid, from offshore wind farms and hydro/tidal schemes.

CITB have previously created solutions to enable smooth transfer between sectors, including construction and nuclear. A specific example of this is the general Construction ILM with niche Nuclear modules available to those who need to specialise and build on a strong generic base of skills. This approach also increases efficiencies and reduces duplication of training for those crossing between sectors. In relation to recording individual's construction related achievements, in April CITB will launch the Construction Training Register. Eventually this will be a record of all construction related training that each individual has completed. This will help with transferring between sectors as all standardised sector training will be recorded and will give employers confidence in what training has been completed. This will be launched alongside the Construction Training Directory which will list the availability all standardised construction related training (which is within CITBs scope) nationally and in a specific location. These systems will support CITB in directing funding to areas of greatest need and in incentivising training in 'fragile' occupations. ***CITB have indicated their support with the ongoing development of the Energy Skills Plan's key interventions- looking ahead.***

The data analysis captured within the Data Pack, highlights the skills demands linked to growth in RQF Level 4+ roles- at first year degree (inc. HNC L4) level and higher 'Chartered' professional level, which is particularly prominent due to the impact of replacement of existing roles linked to age and retirement. Analysis also highlighted that entry level 2/3 roles form an important part of the growth forecast for the sector overall- particularly for trades, operatives and transport roles.

**Electricity Generation and Community Energy-** the demise of petrol and diesel engines, combined with the ascendancy of electric vehicles will act as a catalyst for expanding the generation, storage and usage of electricity. The impact of which will stimulate new investments and technical solutions across the power generation and distribution network as a whole and will likely increase the viability for micro generating, LCRE investment at both a commercial and domestic level.

Community energy alone is defined as covering all aspects of collective action to reduce, purchase, manage and generate energy. The skill set relevant to this area draws in a broad range of technical and non-technical- knowledge/financial and management skills.

Community energy projects have an emphasis on local engagement, local leadership and control and the local community benefiting collectively from the outcomes. Furthermore community-led action can often tackle challenging issues around energy, with community groups well placed to understand their local areas and to bring people together with common purpose. An expanding community energy market referenced by the Department of Business, Energy and Industrial Strategy (BEIS) covers:

- Community-owned renewable electricity installations such as solar photovoltaic (PV) panels, wind turbines or hydroelectric generation.
- Members of the community jointly switching to a renewable heat sources.
- Working in partnership with the local Distribution Network Operator (DNO) to pilot smart technologies.
- Collective purchasing of heating oil for off gas-grid communities
- Collective switching of electricity or gas suppliers.

Aligned with this is the issue of including the enablement of community energy and LCRE solutions linked to economic development initiatives that tackle economic and social disadvantage. Mapping and supporting the acquisition of skills within this context becomes an important aspect of the aims of developing a crosscutting New Anglia social partnership plan for the sector.

Further employer consultation also highlighted the following crosscutting issues:

- engineering fabrication and installation suppliers- pipe cutting and installation, steel fixing, maintenance and downstream supply project management- work broadly across a range of sectors in the New Anglia economy- with petrochemical, agri-tech, construction and energy- representing a generic market demand for 'craft' engineering trades. Feedback from employers has highlighted that craft 'site skills'- measuring, angling, offsetting, cutting and welding (to required standards) - are in high demand and there is a lack of local training available. One key employer highlighted that they were increasingly looking to EU labour to fulfil site roles, particularly for welding functions (approx. 10% of the workforce);
- the growing importance of aligning advanced manufacturing and engineering with energy in the context of Industry 4.0, particularly on the back of the increasing use of digital and cloud-based technologies.
- feedback from employers and from national reports (NSA Workforce Skills- highlights the gender imbalance across the sector's key industries- both in terms of higher skilled, higher paid roles and the supply and upward progression into key roles overall (ECITB highlights that 92% of the engineering construction sector are male)<sup>10</sup>;

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<sup>10</sup> ECITB- Engineering Today (2017)

- concerns regarding the relevancy of contemporary industry experience of the trainers/lecturers at FE and HE level- particularly linked to the increasing use of surveying technology, advances in turbine technology, advanced engineering specialism, changing decommissioning demands on Tier 1 suppliers and gas extraction operations;
- enabling Tier 1, OEMs and broader supply chains need to better understand the fit between 'on the job' skills required for commercial operations and the current provision/qualification offer. Training is usually presented by programme title and qualification rather than career pathway and occupational areas;

### Meeting the Energy Skills Challenge and the Skills for Energy Programme (EEEGR)

Efforts to consult with the SME base locally highlighted the view from smaller businesses, previously consulted via earlier sector-based research, that many of the strategic issues they experienced regarding skills are still relevant. Specifically, the issues that were captured in the 2012 report- **Meeting the Energy Skills Challenge**. This detailed analysis of sector development and skills supply carried out in the 2012 report included canvassing a wide range of employers and stakeholders across the sector. Its key findings were instrumental in establishing the EEEGR led '**Skills for Energy**' programme.

The 2012 report takes a clear strategic shape in assessing the 'structural issues' to develop responsiveness, employer ownership and partnership delivery/alignment- under the 'Skills for Energy' banner- with emphasis on sharing skills intelligence, closer cooperation between suppliers and clients. The report's key recommendations included<sup>11</sup>:

- Recognising growth in offshore, nuclear, marine and CCS, with some growth in micro-generation;
- No critical changes to technical skills demands- with 'underpinning needs' for engineering- operations, installation, maintenance and cross-cutting health and safety needs to enable the integration of some technologies- (e.g. micro generation, bio-energy.)
- Oil and gas- to offshore and low carbon demands- skills transferability needs highlighted, with emphasis on greater cooperation between accrediting partners for H&S;
- Engineering with project management experience- such as marine engineering, aeronautical, geology and generic project management and commercial development skills;
- STEM focus for graduate, FE and school engagement;
- Training offered is too generic and not enough industry specialism across all areas, particularly engineering roles;

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<sup>11</sup> Nautilus Consulting/EEEGR- Meeting the Energy Skills Challenge (2012)

- Embedding employer relationship management and brokering for SMEs in group purchasing/GTA type modelling;

The Skills for Energy programme led by EEEGR since 2012 highlights some of the key recommendations from the 2012 report, with a key focus on coordinating the development of the Energy Skills Foundation programme in partnership with East Coast College and ECITB. The foundation programme acts as an important pipeline into the industry for entry to intermediate roles. Furthermore, EEEGR have acted as a key catalyst for the development of the HE engineering investment at UEA and through Skills for Energy, provide an ongoing developmental support conduit to broker linkages between the industries within the sector and the university programmes. Further highlights of EEEGR's role include an operational partnership with DWP Jobcentre Plus to support the relevancy of job brokering and welfare to work support that reflect the needs of energy employers and a headline annual event to act as a strategic touch point between education and industry to inform raise awareness of energy related careers and education pathways. To align with EEEGR's partnership with DWP locally- CITB also have a national partnership agreement with DWP, which reinforces and celebrates their collective work on promoting the jobs and opportunities available in the sector to DWP clients. A summary of the Skills for Energy programme is captured below.

Project	KPI No.	Details	Measure
<b>Energy Skills Foundation Programme (ESFP)</b>	<b>1</b>	Deliver a successful and informative programme, whilst maintaining and raising the profile to ensure sustainability and a continual meeting of the needs of the industry in a manner that remains unique in its delivery.	Percentage of students who are on track to complete the programme.
			Percentage of students that progress from the course into a position within the energy industry or into further education following the completion of each academic year.
	<b>2</b>	Encourage an increase in industry support through attendance at the programme's events.	Number of industry representatives attending ESFP events during each academic year.
	<b>3</b>	Review, investigate and secure potential additional locations for the delivery of the programme.	Number of locations delivering the programme during each academic year.
<b>Degree Programme Support</b>	<b>4</b>	Maintain and raise the profile of the degree programmes and encourage ongoing industry involvement to ensure course content remains up-to-date, relevant, fit for purpose and consistent.	Number of students that progress from the course into a position within the energy industry or into further education following the completion of each academic year.
	<b>5</b>	Extend our support to alternative providers of Energy Engineering programmes within the region.	Number of relevant locations engaged with the SfE programme during each academic year.
<b>Military in the Energy Industry</b>	<b>6</b>	Provide a programme of support for service leavers and veterans to improve access to the industry.	Number of service leavers contacted per annum.
<b>Energy Employment Adviser (EEA)</b>	<b>7</b>	Improve ability of job centres to meet the needs of the energy industry, increasing knowledge of advisors and opportunities for job seekers, including ex-military. EEEGR to assist with facilitating introductions across the industry to enable greater understanding of the services offered by the jobcentre and by the EEA.	Number of EEEGR / energy industry events / meetings attended by nominated Energy Employment Adviser each quarter.
<b>Introduction to' Courses</b>	<b>8</b>	Promote and support the Introduction to Oil & Gas, Offshore Wind, Nuclear and Energy courses in partnership with East Coast College.	Number of courses delivered each month which meet the minimum number of attendees (6 per course).

Project	KPI No.	Details	Measure
<b>Annual SfE Event</b>	9	Engage with a number of external organisations in order to enlist their support in providing a successful and beneficial event.	Number of external organisations which volunteer their support in relation to the event.
	10	Promote the energy industry within the region and increase education provider's knowledge as to what's to come in the future.	Total number of students attending the event.
			Total number of education providers attending the event.
	11	Encourage current students to consider the energy industry as a potential future career path and ensure that their key influencers are aware of and can understand the opportunities which lay ahead.	Percentage of students indicating that they would be interested in pursuing a career within the energy industry in the future.
	12	Increase the knowledge of event attendees as to the potential careers and opportunities which are presented to the region as a result of the ongoing works within the energy sector.	Percentage of attendees indicating that that following their visit to the event, they are more aware of the roles and career options which the energy industry can offer.
13	Provide a variety of opportunities for industry to interact with students through interactive STEM based activities which aim to excite students about engineering and the types of activities and thinking which it may entail.	Percentage of exhibition stand holders indicating that they would like to return to the event in later years.	
<b>Communications &amp; Promotion of SfE Projects</b>	14	Ensure the engagement of key stakeholders in SfE projects including private and public sectors, academia and education.	Number of organisations present at SfE Workgroup meetings.
<b>External Events &amp; Initiatives</b>	15	Attend and support a variety of external events and initiatives which are key to promoting skills development within the energy industry.	Number of external events and initiatives attended.

**Source- EEEGR 2018**

## College and University Developments

There is an opportunity to achieve a step change in the method of engaging and responding to the sectors employment and skills needs- through the £10 million Energy Skills Centre, coupled with New Anglia LEP investment across the county- including the West Suffolk College £7.5 million Engineering investment. Assessment of an IoT within this context, alongside the engagement with national Sector Deal initiatives- creates a new strategic context to position employer leadership for skills within the sector, drive investment and responsiveness, and develop a New Anglia wide multi-site offer.

The existing Skills offer is extensive in terms of engineering related provision and the new skills infrastructure investment creates greater opportunity to deliver technical and responsive solutions. However, the presentation of the offer for New Anglia is generally set at a lower technical 'foundation level' from an employer's perspective, despite recent investment made by UEA in its HE Engineering faculty and undergraduate and postgraduate levels.

In addition, training programmes are described by award or qualification and predominantly within engineering and construction related pathways- and not as a common training plan for energy per se and are generally limited up to and including extended diploma Level 3.

The progression of career and training route ways for key technical energy related jobs is therefore not presented, particularly for the engineering roles described across the key industries. This is particularly the case for apprenticeship pathways from intermediate, higher and advanced levels. Given the implementation of the apprenticeship levy- there should be a more coordinated approach to gather and deliver apprenticeships linked to employer needs.

A common theme emerging from the consultation with employers through the research was the importance for the 'joined up' momentum between the FE and HE community to be maintained for the benefit of the sector overall.

*Appendix C captures the local provision matrix, including FE, HE, apprenticeship and known private sector provider training opportunities.*

## Further Views from industry and stakeholders on the responsiveness of skills provision

- **Energy Social Employment and Training Partnerships-** Employers expressed the importance of developing social partnerships to strengthen the number of young people and new entrants into the Energy Sector, particularly targeted in key areas of New Anglia that experienced higher levels of economic and social exclusion. To this end it was felt there needed to be closer examination of how provision aimed at helping people gain the relevant skills to enter into the sector from a disadvantaged

starting point was appropriately linked in to industry within the sector itself. It was felt that mainstream DWP provision, as well as ESF and Big Lottery Funded activity could all be 'hard-wired' alongside industry investment in work experience, entry level job opportunities and targeted careers advice and enterprise support initiatives. EEEGR, through their Skills for Energy programme, have been a trailblazer in this area, with a unique focus on working with DWP locally to align sector-based employment support with proximity to the industry through its members.

- **Adult Skills Budget and Strategic 'Multi-sited' Alignment-** The Tier 1 employers emphasised the importance of ensuring that the adult skills budget was appropriately aligned to the emerging needs of the sector overall and that the planning and allocation of funds particularly at an FE level was reflective and responsive to need. The advances seen with the FE College Group network and the Energy Skills Centre 'hub' at East Coast College was seen as a significant step in developing the overall responsiveness of the local training and skills offer. Employers engaged with the Sector Deal development nationally highlighted that the potential of the Institute of Technology programme would act as an important element overall for creating national sector specialism across New Anglia, providing multi-sited, accessible and relevant T1 skills expertise. Feedback from EDF Energy and EEEGR highlighted how the IoT could help respond to the 'generic' call for producing an adaptable and flexible engineering supply for the sector overall.
- **Energy Apprenticeship SME Charter-** SME engagement and apprenticeship demand- overall the uptake of energy specific apprenticeships has been difficult to evidence due to the specific sector mapping definitions established in the plan's scope. Apprenticeship supply is largely channelled through cross-sector demands within construction and manufacturing areas. Larger employers however are keen to stimulate greater apprenticeship uptake from their supply chains as a way of demonstrating quality in their own upstream service offer to Tier 1 clients. With the advent of the apprenticeship levy- feedback highlighted that the timing is opportune to promote a more 'group training' based model for SME engagement in apprenticeships, with ECITB cited as a potential sponsor of a pooled model, which defines a generic set of technical skills that can be universally offered across the area and then recognises areas of specialism according to industry specific roles.
- **Single Workforce Planning Conversation-** stakeholders, including recruitment and training bodies, expressed the frustration of having to work reactively to service training and employment demands for the sector overall- based on limited, short term knowledge of projects and upturn patterns. Given the planned national scale investment for nuclear and offshore and the recognition of an upturn in gas production, alongside a universal recognition of the 'generic and flexible pull' across the key industries- a single workforce planning schedule or prospectus would give confidence in the service providers to invest time and resources against forecast growth areas.
- **"Future Energy"- careers and enterprise coordination-** the importance of influencing the careers and enterprise system to promote the sector overall, inform

post 16 education and training choice and drive enterprise capability- were universally highlighted by all employers and key stakeholder consulted. The Tier 1 employers consulted expressed the importance of building the local capacity of supply given the sharp upturn in workforce demand expected for the offshore and nuclear new build programmes. Consideration was expressed around identifying local training and employment targets to maximise the job opportunities for New Anglia residents, with specific geographic targeting for areas of high deprivation. The initial task and finish group activity highlighted a proactive careers and enterprise strategy as the overall key priority for the plan, given the importance of addressing supply shortfalls, particularly for STEM roles and the gender imbalance (92% of the national construction engineering workforce are men (ECITB, 2017)). Labour market intelligence published by ECITB highlights on a national scale the opportunities for growing the next generation of engineering professionals, balanced with the challenges of age- with an anticipated 91,000 engineers (20% of the national workforce) having retired or being close to retirement by 2026.<sup>12</sup>The new National Careers Strategy (2017) outlines a detailed plan to align teaching, careers advice and enterprise support-promoted by industry- as an overarching response to the Industrial Strategy and drive towards a social inclusive UK.<sup>13</sup> It is therefore important to position the response from industry on this consultation within this broader context, given the proactive developments occurring on Sector Deals and significant infrastructure development. At the centre of the new Careers Strategy is the role of the national Careers Enterprise Company, localised Careers Enterprise Development intermediaries and employer led Enterprise Advisers. A careers and enterprise sector intervention overall would need to engage with these elements to shape and influence how the national strategy evolves across New Anglia. The region is already in a strong position with existing activity coordinated through innovative online platforms such as 'icanbea...' which is being used by Tier 1s across New Anglia and the careers awareness events coordinated through EEEGR.

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<sup>12</sup> ECITB- Engineering Today: The Supply and Demand for Engineers in the UK (2017)

<sup>13</sup> National Careers Strategy: Making the Most of Everyone's Skills and Talents (2017)

## The Energy Sector Skills Plan

### Priorities for Action

The analysis of need from the consultations and reports on the Energy sector's key industries nationally, shows that the sector faces a series of current and future challenges in sourcing the workforce and skills needed to support current operations and future market opportunities. The evidence captured highlights a range of ongoing, deeply rooted, issues that the sector faces, which were identified in 2012- including the availability of engineering technical skills at a level higher than what is currently experienced (i.e. RQF 4+).

Furthermore, the issues of increasing fresh supply into the sector, STEM engagement and developing the flexibility of the local workforce to operate between industries, remain underlying challenges.

The consultation with the key employers that responded to the invite to take part in developing the skills plan evidence base, has highlighted a genuine awareness of the key barriers faced across the sector and a willingness to get involved in to address them. Overall employers seem keen to work together to address future skills supply issues.

The priority actions set out in the plan are designed to address the issues identified through the employer consultation:

- i. **Mobilising Industry Leadership-** the advent of the Industrial Strategy and opportunity to drive co-investment through Sector Deals, combined with a new Careers Strategy- offers an opportune timing to corral industry leadership to give voice and oversight- input, intelligence and guidance- to address the main demands the sector experiences now and will face in the foreseeable future.
- ii. **Developing a higher technical engineering offer-** Feedback highlighted that there was a robust 'generic' training offer up to foundation level but there was a lack of higher technical engineering route ways- both via traditional graduate engineering programmes and through vocational training options. The feedback overall highlighted the need for a better supply of local, graduate level, mechanical and electrical engineering skills.
- iii. **Building 'intra-industry' and 'inter-sector' workforce transferability-** Understanding the transferability of skills-, and how that knowledge can be applied to the phasing of projects, will be essential in supporting the industry and strengthening those skills currently regarded as fragile. The feedback from employers highlighted two levels of planning- one involving assessment of project lifecycles and workforce planning between industries within the sector and a further dimension understanding the dynamics between the sector overall and its inter-relations with New Anglia's other priority sectors- specifically construction and advanced manufacturing.
- iv. **Addressing overall 'Energy Skills Fragility'-** applying NSA Nuclear/Cogent's model for defining 'skills fragility' and recognising the generic nature of demand across the sector, allows a suite of key skills sets to be defined. Accordingly, to drive responsiveness in the skills system- the skills community should plan and communicate joint solutions for addressing skills weaknesses, demonstrating how both course content and outcome meets need and developing the accessibility of training for employers and learners across New Anglia via a multi-site offer.

- v. **Building Inclusive Local Capacity & Securing the Future Energy Workforce** - there are a number of pressure points and key concerns identified linked to the future supply of employees into the sector overall. Key issues cover addressing the combined scale of replacement and growth demands, addressing gender and age imbalances, stimulating private sector investment and whole sector coordination in careers and enterprise engagement and creating a universal set of social aims to maximise the positive impact the sector has for New Anglia and its areas of key economic/social pressure.
- vi. **Apprenticeships and Group Training**- Given the implementation of the apprenticeship levy- there should be a more coordinated approach to gather and deliver apprenticeships linked to employer needs. Apprenticeship supply is largely channelled through cross-sector demands within construction and manufacturing areas. Larger employers however are keen to stimulate greater apprenticeship uptake from their supply chains as a way of demonstrating quality in their own upstream service offer to Tier 1 clients. With the advent of the apprenticeship levy- feedback highlighted that the timing is opportune to promote a more 'group training' based model for SME engagement in apprenticeships, with ECITB cited as a potential sponsor of a pooled model, which defines a generic set of technical skills that can be universally offered across the area and then recognises areas of specialism according to industry specific roles.

The skills plan captures and expands these six priorities as key interventions- defining the rationale, action, leadership, timing and support resources for delivery.

### **Leadership and Implementation: Reviewing Existing Partnership Structures**

New Anglia's Energy Sector is a growing and productive market, with internationally significant investment across its core group of industries and with an increasingly important role to play in the overall challenge of meeting the UK's current and future energy demands. The adoption and utilisation of skills are fundamental within higher performing workplaces and there is a clear call to align skills with economic competitiveness through the new Industrial Strategy and the UK's key industrial sectors, of which Energy is one. The delivery of the sector skills plan should be led and supported by industry; furthermore, the plan itself should act as a tool to influence change and help achieve a balance of short, medium- and longer-term goals. To this end an underpinning vision would give direction and overall purpose for the skills plan itself, with a model vision being:

*'To achieve a world class skills offer for New Anglia's Energy Sector, which enables its industries to be productive and competitive, provides greater career opportunities for all and delivers a highly talented, flexible workforce.'*

To achieve this single vision *three key aims* can be established as the guiding principles for New Anglia's Energy Skills Plan:

- To *empower* leaders within the Energy Industry and Skills Sector to work together as a single group to lead through change and achieve the common vision/core aims- of the Energy Skills Plan;

- To *innovate* new solutions in response to the ongoing skills challenges the industry faces, through robust, ongoing, consultation and effective collaboration between the sector's employer and skills community;
- To *grow* the future and current workforce, enhancing the coordination between industry and education, developing effective workforce mobility between the sector's main industries and delivering greater opportunity for all New Anglia's residents to gain and sustain a career in the Energy sector.

To achieve the vision and core aims of the Energy Skills plan, effective leadership and governance is important. Leadership, balanced between employers and the education and skills sector but with employer responsiveness at the core, should play the primary role in driving forward the plan's key priorities. As it stands the partnership and stakeholder 'map' for the Energy Skills sector is genuinely perceived as fragmented and causes a dilution and duplication of resources and intelligence overall- this was a common issue highlighted via the stakeholder consultation. There was also optimism expressed by stakeholders that a realigned partnership approach would help balance both Norfolk and Suffolk's interests, reflecting the spatial clustering and the more coastal distributed spread of the sector's key industries.

An optimum partnership model should aim to build on the key assets already in place across New Anglia and work with the New Anglia LEP and the Skills Board, to affect change and oversee delivery plan activity- in a cost effective and consistent approach.

The partnership model should aim to *consolidate rather than displace* important existing activity, but it should be given the mandate to challenge and positively support developments within the skills system across New Anglia that affects the Energy sector. In terms of HE and FE, New Anglia is already well placed to align and work strategically with industry. New Anglia's FE Principals' Group and the presence of an Energy Skills Development Coordinator- backed by FE, will ensure colleges are able to work directly with industry at a strategic level to deliver the interventions in this plan.

To this end the existing key groups and key activities that have a focus on skills for the Energy Sector should be consulted, with the intention of adapting and rationalising them to ensure they are representative of the sector overall, as defined in this plan. Furthermore, it will be imperative that they can work directly with the New Anglia Skills Board to deliver the recommended interventions. The key groups/partnerships to consult with cover:

- Suffolk Energy Coast Delivery Board- Skills Sub Group (SECDB-SSG)
- Skills for Energy Working Group (chaired by EEEGR, which feeds into the main EEEGR Board)
- ECITB and the Skills for Energy Partnership (EEEGR) and the nascent Energy Skills Centre Partnership (East Coast College)
- NSA Nuclear and the Sizewell Supply Chain Network (Suffolk Chamber)

It is important to reiterate that the role of the New Anglia Skills Board is to drive the strategic vision and tactical aims, and priorities, of New Anglia's suite of sector skills plans- across all of New Anglia. The Skills Board recognises the competitiveness of the skills market as a 'positive force' and aims to work with expert stakeholders such as EEEGR, the Orbis Energy centre, the New Anglia Advanced Manufacturing & Engineering Network (NAAME), the

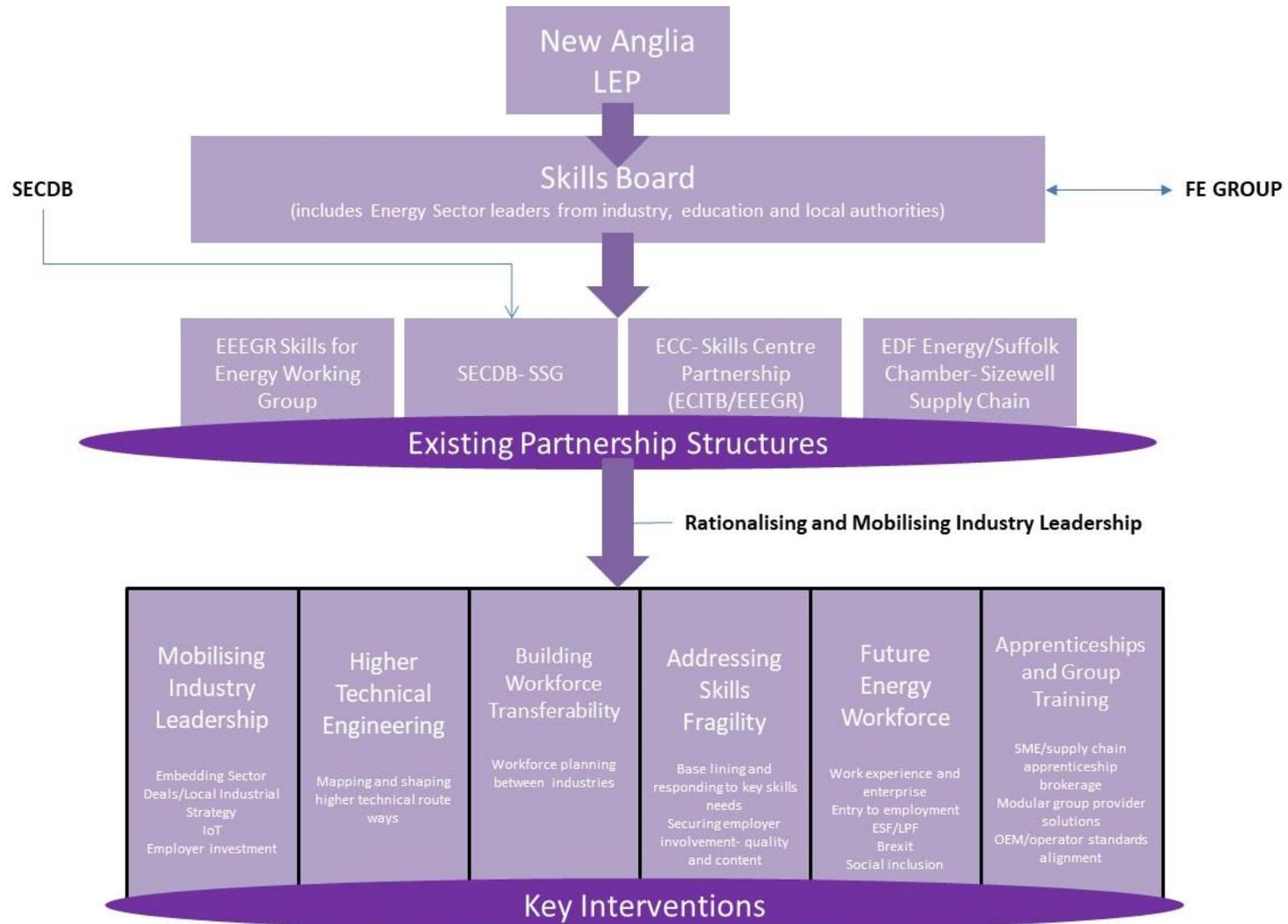
Chambers of Commerce and other interest groups to align- but not dictate- activity. Furthermore, the activity linked to education and enterprise support is complex and cannot be directly governed due to national, regional and localised funding streams and sponsors. The Skills Board encourages these stakeholders to deliver an effective interface with key employers aiming to engage and influence skills outcomes. Furthermore, to ensure the interventions established within this plan can be successfully implemented, a common framework of action needs to be established cooperatively through strong, joined-up, partnership working.

The new Industrial Strategy positions the importance of developing national influence between key sectors and skills partners, to drive skills reform and maximise the resource 'investment balance' between private and public sponsors. Employer Ownership of Skills has already been tested by government and the advent of the Employer Levy signifies increased importance of providing skills outcomes that ultimately drive productivity.

To this end partners should ensure there is a focal point for embedding regional elements of any sector deal awarded that bears influence on the Energy sector's key industries, aiming to position New Anglia as a centre of excellence for energy skills.

The **consultation map** between the New Anglia Skills Board, existing partnership groups and the Energy Skills Plan's key interventions- is summarised below.

**Partnership Consultation Map**



## Proposed Skills Interventions

### Intervention 1- Mobilising Industry Leadership

**Rationale:** the advent of the Industrial Strategy and opportunity to drive co-investment through Sector Deals combined with a new Careers Strategy- offers an opportune timing to corral industry leadership to give voice and oversight- input, intelligence and guidance- to address the main demands the sector experiences now and will face in the foreseeable future.

There was a considerable consensus from stakeholders that the established Energy Skills partnership arrangements did not always have the level of cross- sector representation or strength of employer voice. There was also a concern, however, about the risks of creating 'yet another group' which may result in duplication and further time commitments.

**Action to be Taken:** consultation with employers through the skills planning exercise including addressing a key theme focused on taking forward skills action for New Anglia.

Employers were keen to express their views regarding skills issues and also positive about their involvement in steering the ongoing development of the skills planning interventions.

Proposed actions include:

- Review the remit of existing key skill partnership groups to establish their potential to evolve into an employer-led, New Anglia-wide sector skills steering group that could represent the New Anglia sector; across the specific industries / geographies, articulating a broad employer voice (both Tier 1 and local employers); and including other stakeholders such as skills providers, local authorities etc.
- Either develop an existing stakeholder group (e.g. Skills for Energy / SECDB) to take on this exciting remit or create a totally new group
- Establish the terms of reference and membership of any new partnership or revised group using input from the New Anglia Skills Board;
- Consider relationships with existing skills related partnerships and identify roles and responsibilities, ensuring that duplication is avoided, or rationalisation takes place;
- Identify the relevant chair/lead sponsor role(s) and delivery plan (ensuring the conduit with the Skills Board is maintained);
- Position Sector Deal and Skills Plan priorities- helping to support industry through joined-up local leadership and identify the areas of specialism that promote New Anglia on a national scale;
- Provide a strategic focus for mapping and targeting skills investment for New Anglia, including skills infrastructure development, extra adult skills funding opportunities and careers and enterprise public/private sector initiatives.

**Leadership:** Overall industry itself should have oversight of the Energy Skills Plan across all of the strategic interventions; however, there should be a strategic, strong and responsive representation with education and Local Authorities.

Overall sponsorship should align with Skills Board sector representation.

**When:** the intervention is a key underpinning step to ensure the successful implementation of the Skills Plan and broader strategic development of skills/economic growth for the Sector.

The partnership revisions should be established and launched by September 2018.

**Resources and support:** resourcing revised partnership arrangements should be a joint responsibility across the core membership, with the LEP/Skills Board identifying the most efficient method of providing a dedicated support mechanism to oversee practical issues, secretariat, communication and coordination of output.

### Intervention 2- Developing a Higher Technical Engineering Offer

**Rationale:** Feedback highlighted that there was a robust 'generic' training offer up to 'foundation' degree but there was a lack of higher technical engineering route-ways- both via traditional graduate engineering programmes and through vocational training options. The feedback overall highlighted the need for a better supply of local, graduate level, mechanical and electrical engineering skills.

Employers have expressed some frustration at the lack of skills supply at a technical engineering level- from RQF 4 and above, with a particular emphasis on Graduate and Postgraduate options- notably for the oil, gas and offshore industries. The recent national labour market research carried out by ECITB highlights a sharp fall in graduate and college taught engineering output (being at its lowest level since 2012).<sup>14</sup> It was recognised that there was a growing energy engineering presence from UEA and UoS but that this output had technical limitations (instrumentation at height, fault finding and operational roles). Feedback illustrated that engineers with technical capability were often sourced from out of the region, with Strathclyde cited as an area of expertise.

Feedback from education stakeholders highlighted the need for a firm business case- expressing demand that is of a significant scale to warrant skills investment and infrastructure development. Industry specialists also cite examples of where the local area has competitive skills advantage. For example, the Southern North Sea is one of the first regions to undertake large scale decommissioning and there is real potential to create specialist skills (e.g. well-plugging and abandonment) which could be exported globally.

**Action to be Taken:** Creating and sustaining the ability to hold a joint dialogue to capture, define and deliver technical engineering is required.

- Develop closer links to the key industries that have highlighted skills gaps within technical engineering role- ensure an ongoing process is developed;
- Define technical capabilities and align with existing and new ASB and HEFCE funded provision- identifying course modules; The evidence base and the skills discussions with employers suggest that specialist provision in areas such as: - Control and Instrument Engineers; Safety engineers; Commissioning Engineers; Electrical Engineers; and Project and planning control are areas where high quality local jobs (both replacement and new jobs) are proving very difficult to fill.
- Build a strategic dialogue with HEI validating bodies such as UoS in terms of budget allocations and the flexibility to respond to energy sector needs
- Define learning delivery sites and methods- maximising the role industry can play in sponsoring and informing engineering provision – both areas of pressing skills gaps, but also areas of opportunities to develop new skills sets.;
- Capture and quantify demand patterns over time;
- Understand how school and FE engagement can stimulate learner demand into engineering route ways.

**Leadership:** EEEGR have already played a key role in brokering the engagement between UEA and industry for HE engineering and should be consulted on how they could provide further facilitation through the Skills for Energy programme- to stimulate better technical engineering supply. ECITB are entering into an ongoing programme nationally of enhanced labour market analysis and more detailed surveying of workforce

<sup>14</sup> ECITB- Engineering Today (2017)

development patterns with their contractors. Consultation with ECITB has highlighted the opportunity to align this new data feed, which they expect to regionalise, with a New Anglia engineering focus. Clearly the industry needs to work with Colleges and Universities to develop new models of course provision which are responsive and flexible to industry needs and which attract non-traditional entrants- recognising the age and gender imbalance already prevalent for the sector.

**When:** the development of technical engineering provision and skills supply is an ongoing process however the key steps can be made time bound in establishing a more detailed plan, mapping and defining needs and performing feasibility assessment with the education and training stakeholders. To this end a two-stage process can be identified:

- Stage One- establish facilitation roles, broker industry involvement and skill stakeholder engagement- by end of 2018.
- Stage Two- define and develop course content meeting technical demands- from 2019 onward.

**Resources and support:** Consultation with EEEGR or an identified key partner/ facilitating lead to assess resource needs should be performed. ECITB should also be further consulted to identify the support role they could play on behalf of the engineering construction industry.

Ultimately, the process will need to be robust enough to stimulate college and university investment in new course content, which focuses on technical training content. The support of the Energy Skills Partnership and its proposed role of targeting funding investment based on areas of specialism will also help maximise the potential of additional funding from government and private investors.

**Intervention 3- Build local pilot models of ‘Intra-industry’ and ‘Inter-sector’ Workforce Skills Transferability (through influencing national stakeholders and local collaboration, and innovation)**

**Rationale:** Understanding the mobility of skills-, and how that knowledge can be applied to the phasing of projects, will be essential in supporting the industry and strengthening those skills currently regarded as fragile.

The feedback from employers highlighted two levels of planning- one involving assessment of project lifecycles and workforce planning between industries within the sector and a further dimension understanding the dynamics between the sector overall and its inter-relations with New Anglia’s other priority sectors- specifically construction and advanced manufacturing.

Although there was a strong view that increased planning based upon forecasts was needed, there was also a recognition that such forecasting is challenging and potentially unreliable.

**Action to be Taken:** A cross-industry and cross-sector planning framework shaped from Tier 1 led investment programmes, that can be made widely available to the supply chain, skills providers and recruitment sector, can build a more proactive service offer that anticipates peak demand and the relationship between downturn and growth areas. A working group linked to the revised energy partnership structure (See Intervention 1) can act as a focal point to capture and aggregate workforce planning profiles and define generic/niche skills requirements.

The New Anglia FE College Group is already adapting its activity jointly to provide an increasing multi-sited and modular offer, and this can be used as a platform to target skills needs that are required beyond generic skills sets.

CITB should be invited to take a key role in steering the crosscutting priorities between construction and the Energy sector, given their involvement in the New Anglia Construction Skills Plan and their national activity linked to the Construction Training Register and building workforce transferability.

- Consult and influence a range of national stakeholders about the economic (and community) benefits of ‘intra-energy’ sector transferability. These could include bodies such as OPITO, Renewables UK, the Wind Industry Council, Nuclear Industry Council and also Tier One employers with local developments pending.
- Baseline current and forecast workforce demands based on current operational activity and planned infrastructure investment;
- Analyse skills sets by functional job roles and aggregate energy generic, energy industry specific and inter-sector skills needs;
- Consult with CITB on construction-energy workforce transferability, referring to previous CITB examples;
- Share intelligence with the FE College Group and disseminate across known supply chain/make public- at key planning points that works with the academic planning and development timetable;

- Develop generic skills route ways, maximising the accessibility and 'joining-up' of course provision across colleges (working with ESFA to agree allocation frameworks);
- Identify barriers preventing effective pass porting of skills sets and labour supply (for example H&S accreditation) and design effective solutions.

**Leadership:** CITB and ECITB, Tier 1 developers, OEM and Tier 2 employers involving large supply chain activity, LEP/Skills Board, FE College Group, ESFA, NSA Nuclear.

**When:** This should be established as a process to support a cooperative plan and response discipline. A target date for the initial skills planning framework should be established, with a suggested date being September 2018 and refreshed on an annual basis.

**Resources and support:** The intervention requires a joint commitment from Tier 1 and key OEM employers within the sector working alongside the key training provider group, with support from the ESFA and industry training boards, sector representative bodies that can map national data and planning metrics to a New Anglia level.

The output should be 'open source' to stimulate a fair and open competitive response from the wider training and recruitment markets.

#### Intervention 4- Addressing Overall 'Energy Skills Fragility'

**Rationale:** applying NSA Nuclear/Cogent's model for defining 'skills fragility' and recognising the generic nature of demand across the sector, allows a suite of key skills sets to be defined.

Accordingly, to drive responsiveness in the skills system- the skills community should plan and communicate joint solutions for addressing skills weaknesses, demonstrating how both course content and outcome meets need and developing the accessibility of training for employers and learners across New Anglia via a multi-site offer.

Skills investment planning should be prioritised according to shortfalls and gaps linked to key roles within industry. Within the Nuclear Workforce Assessment report (2017) areas of '**skills fragility**' are defined, that highlight where demand outstrips supply across higher technical, technical, entry level and generic roles. The result is a key list of roles (by resource code/function/specialism) of high-risk areas. Performing a broader analysis through consultation across industries within the sector and with manufacturing and construction stakeholders, would ascertain a sector wide Skills Fragility statement. The Opportunities and Challenges section of this plan captures evidence across a range of key known gaps and demands, which should form an initial baseline of assessment- these involve both technical and non-technical roles, including:

- site fabrication engineers,
- instrument engineers,
- operational and maintenance engineering,
- turbine installation and O&M,
- decommissioning key engineering and project management functions,
- operational and project management,
- commercial and financial planning.

Cross-sector feedback with employers in the engineering fabrication industry showed a lack of labour supply into engineering craft roles- pipe cutting, angling, drawing and a lack of local training provision to produce a skilled labour supply. This in turn was increasing their reliance on EU labour – something potentially implicated by Brexit.

#### **Action to be Taken:**

Risk assessment can be performed on short/medium and long-term trajectories and the output can be used to inform careers planning, course design and development and industry led activity to stimulate further skills investment.

- Consult with Cogent Skills/NSA Nuclear on risk assessment methodology;
- Plan sector wide consultation on skills fragility over defined forecasting periods;
- Capture high risk functions and consult with industry to map skills gaps linked to functional roles;
- Use the Energy Skills Partnership to facilitate a joined-up response to high risk needs- brokering a response between the sector and the education and training community.

**Leadership:** Tier 1 and key employers working with Tier 1/OEM suppliers, sector representative bodies- ECITB, NSA Nuclear/Cogent, CITB, LEP/Skills Board and the Energy Skills Partnership.

**When:** An ongoing process, with an initial skills risk assessment performed by the end of 2018.

**Resources and support:** The intervention requires a joint commitment from Tier 1 and key OEM employers within the sector working alongside the key training provider group, with support from the ESFA and industry training boards, sector representative bodies- that can map national data and planning metrics to a New Anglia level. The output should be 'open source' to stimulate a fair and open competitive response from the wider training and recruitment markets.

### **Intervention 5- Building Inclusive Local Capacity & Securing the Future Energy Workforce**

**Rationale:** there are a number of pressure points and key concerns identified linked to the future supply of employees into the sector overall. Fundamentally, there was an oft-stated view that the potential of the sector in terms of high-quality job opportunities and local career paths is under the radar.

Key issues cover addressing the combined scale of replacement and growth demands, addressing gender and age imbalances, stimulating private sector investment and whole sector coordination in careers and enterprise engagement and creating a universal set of social aims to maximise the positive impact the sector has for New Anglia and its areas of key economic/social pressure.

The Tier 1 employers consulted expressed the importance of building the local capacity of supply given the sharp upturn in workforce demand expected for the offshore and nuclear new build programmes. Consideration was expressed around identifying local training and employment targets to maximise the job opportunities for New Anglia residents, with specific geographic targeting for areas of high deprivation.

**Resources should be specifically targeted at areas of higher economic and social deprivation- including Waveney, Lowestoft and Great Yarmouth.**

**Action to be Taken:** An overarching recruitment target that represents the scale of *replacement and growth* demand for the sector should be established to focus partnership activity.

As a whole Energy sector, to provide coherent, consistent, targeted messages to young people, local workers and influencers such as parents, teachers, employment advisers about the opportunities, excitement, diversity and vibrancy of the Energy sector and the range of high-quality opportunities and career pathways that are available. This intervention comprises three key elements:

**(i)Careers and enterprise-** the approach will need to be comprehensive and co-ordinated - working with the local Enterprise Development Coordinators that are aligned with the LEP and the CEC, facilitating the 'intermediary' stakeholders engaged or keen to engage with education to inform careers delivery and enterprise capability activities. Aligning with Sector Deals and the national Careers Strategy, New Anglia should consider the further development of the New Anglia Youth Pledge, which can support the Gatsby benchmark model pushed through the national Careers strategy and define how the sector's needs are best embedded from KS3 upwards.

Careers awareness and work experience/internship programmes should be coordinated through a central '**Securing the Future Energy Workforce**' plan- working with established providers, such as primary NCS delivery, Enterprise Advisors and the icanbea...online platform. Employers have expressed willingness to engage and invest in careers support initiatives and so should be secured within an overall partnership approach.

**(ii)STEM Engagement-** A STEM engagement plan should work jointly with the STEM ambassador programme and the Advanced Manufacturing Skills Plan- developing cross links with engineering sector bodies and existing STEM enterprise initiatives. CITB

already have an established Ambassadors programme nationally, which could be linked to the STEM Ambassadors programme.

**(iii) Establishing a Social Partnership Programme-** Social outcomes should be defined to fit with the overall recruitment and up skilling aims agreed by partners supporting the delivery of the Energy Skills Plan and the social mobility aspirations of Ipswich and Norwich Opportunity Areas. Targeted activity should also focus on addressing gender and age imbalances. Furthermore, social inclusion programmes such as ESF, DWP and Big Lottery funded activity, which are geographically targeted- should be supported to review and adapt their ability to represent the needs of the energy sector, particularly with work experience, volunteering and entry level employment. Connecting to the NEACO project will enable the sector to have a greater influence on those from skills-deprived areas considering higher education routes

**Leadership:** EEEGR should be consulted, along with other organisations regarding taking forward the key role in coordinating the intervention overall- as it aims to build upon their already successful activity within the Skills for Energy programme.

Consideration around resources to expand the approach for all of New Anglia and broader partnership working would need to be made, with ideally a 3-5-year resource plan in place to design, embed and manage the activity on a medium-term timeframe.

**When:** An **annual action plan- ‘Securing the Future Energy Workforce’** should be developed that details the priorities for the three key areas of: - careers and enterprise, STEM engagement and establishing a social partnership programme to maximise social outcomes.

**Resources and support:** resource needs for co-ordination are comparatively modest but it is important that a central resource, guaranteed for 3-5 years initially is secured to help co-ordinate careers delivery.

The majority of resources needed for delivery are already in place, through regional programmes (e.g. icanbea, Enterprise Coordinators and the Enterprise Advisor Network) and nationally (e.g. Careers Enterprise Company, EEF, tomorrowengineers.org.uk run by Engineering UK and Royal Academy of Engineering, access IET provision). In addition, many businesses in the sector work with schools and FE/HE to promote the industry.

### Intervention 6- Apprenticeships and Group Training

**Rationale:** Apprenticeships are positioned centrally within the Industrial Strategy's focus on people and workforce development, with any localised industrial response, including sector deal developments needing to be cognisant of investment in apprenticeships.

**It was widely recognised by stakeholders and data analysis of apprenticeship numbers that there is considerable scope to increase the proportion of the workforce undertaking an Apprenticeship development pathway at all levels.**

Given the implementation of the apprenticeship levy- there should be a more coordinated approach to gather and deliver apprenticeships linked to employer needs. Apprenticeship supply is largely channelled through cross-sector demands within construction and manufacturing areas. Larger employers however are keen to stimulate greater apprenticeship uptake from their supply chains as a way of demonstrating quality in their own upstream service offer to Tier 1 clients. With the advent of the apprenticeship levy- feedback highlighted that the timing is opportune to investigate the feasibility of a more 'group training' based model for SME engagement in apprenticeships, with ECITB cited as a potential sponsor of a pooled model, which defines a generic set of technical skills that can be universally offered across the area and then recognises areas of specialism according to industry specific roles.

Feedback from employers- particularly Tier 2/suppliers operating as key resource providers for installation, operations and maintenance roles within oil, gas and offshore wind- expressed frustrations regarding the polarisation of existing apprenticeship standards caused by diverging OEM and operator requirements. Rationalising standards to enable the combination of key technical roles, particularly across engineering apprenticeship provision would enable greater local investment in apprenticeship provision. Larger employers are keen to stimulate greater investment in apprenticeship provision in response to the levy and for those that are already paying a levy through the construction and engineering construction contractor routes- there are significant investment opportunities. Feedback however highlights an overall lack of investment in apprenticeship provision, with employers citing concerns relating to the time and cost of training, upturn and downturn patterns, fit between technical standards and real operating environments and risk of 'attrition' through recruitment competition once qualified. A group training solution would offer a shared, cooperative solution- allowing for the formal creation of GTA legal entity- as a shared partnership between employers and training providers. Success rates of training through GTAs generally exceed national averages and they have proven to be sustainable models, securing employer ownership, for many key sectors and areas across the UK.

**Action to be Taken:** An ***Apprenticeship Charter of Cooperation***- could act as the initial foundation for the development of a GTA for the Energy sector for New Anglia, involving an initial period of partnership development and feasibility assessment before the potential establishment of a legal GTA body. The key stages in this context would include:

- Establish a campaign, in partnership with local / national skills providers to promote Energy-sector based Apprenticeships to both local employers and potential apprentices, with the option of target -setting for an increase in overall numbers or targeted occupational roles.

- Assessment of scope for establishing an apprenticeship charter- by industry or overall sector;
- Consult with levy payers to identify opportunities for surplus levy investment into apprenticeship development for local supply chain employers
- Identification and brokerage of the initial employer/provider partnership with the aim of reducing and sharing the risk of developing new provision;
- Mapping existing apprenticeship standards to skills needs and identifying group training options;
- Decision on commitment to application for GTA status in consultation with ESFA focusing on timescales where a significantly increased demand for apprenticeships is confidently forecast due to expansion or new major projects starting;

**Leadership:** Any consortium of training providers and employers are able to pursue the development of a GTA model. In the context of the skills plan and key stakeholders consulted- it would be recommended that the FE college group, CITB, ECITB, the ESFA, alongside EEEGR/employers and the LEP perform the initial scoping to establish the feasibility of a GTA model for the sector.

**When:** Initial assessment- brokerage and feasibility planning- should be performed throughout 2018/19, with the intention of concluding the assessment by July 2019.

**Resources and support:** The intervention can be established as a sub-group of the revised energy skills partnerships (**See *Intervention 1***), with a shared commitment from its key members to coordinate and deliver the identified brokerage and scoping activities.

## Appendix A- Energy Skills Plan Development Process

The development of the Energy Sector Skills Plan was overseen by a task and finish group, which met several times between April and July 2017 and a further LEP/Key Stakeholder group, which included key employers- that met between October 2017 and February 2018. The final plan was presented to a key stakeholder group, which included industry representation from the New Anglia Skills Board in February 2018. In addition to this sector skills plan document, a supporting Datapack has been produced which outlines the current workforce in the sector, trends in its skills levels and how the local Energy sector in New Anglia compares with other areas. The Datapack also reports on the underlying socio-economic context for the sector locally and reports on projected changes in future skills needs and current student numbers.

To capture primary evidence through qualitative, **semi-structured**, interview methodology with the employers and key stakeholders we established a series of key themes and lines of enquiry. The key lines represented a framework to guide the consultation process however the questions were not prescriptive and the semi-structured approach enabled further issues to be detailed based on the responses from the consultees.

### **Key Themes & Lines of Enquiry**

Five key themes were identified and agreed following the initial research- focusing on existing policy, quantitative data analysis and previous sector intelligence that has been captured and reported. ***The feedback from the key lines, along with the earlier quantitative and desk-based research, shaped the evidence captured in ‘Opportunities in Challenges’ in the main report and the rationale for each strategic intervention in the Delivery Plan.***

#### **Theme 1- Training Investment and the Jobs Market**

*What are the main areas of training that employers invest in within their business? Do they expect their training needs to change over time- if so why and in what way?*

*Do employers have confidence in the current labour market? Are they able to find the relevant skilled staff or are there gaps and barriers? Are they recruiting- if so to what roles and what are their expected recruitment needs?*

#### **Theme 2- Training Delivery**

*Where do employers go for their training- what type of provider, provision/qualification and where are they located? How do they rate the training they access and what can be done to meet their needs better?*

### **Theme 3- Apprenticeships and Workforce Development**

*Do employers recruit apprentices? If so- in what standards/job roles and if not- why, are there job roles that are not served by apprenticeship provision? Do employers anticipate that the levy will stimulate further interest and investment in apprenticeships? What are their views regarding the development of their existing staff workforce and apprenticeships?*

*How are you affected by the transferability of skills both in terms of recruiting to the energy sector from other industries (O&G for example and the skills needed to transfer) but also candidates diversifying into other industries and markets outside the area and the skills gaps this would leave in the energy sector?*

### **Theme 4- Recruiting New Entrants and Promoting Future Supply**

*Where do employers look for taking on new entrants? What level of experience must they have and what is their view on recruiting young people- both non-graduates and graduates? How can their industries be promoted to young people to encourage new supply and what 'key employability skills' should they have? Are employers interested in supporting the coordination of enterprise and STEM engagement within schools, colleges and universities?*

*How do changes in technology (in terms of the types of equipment and processes (drone/UAV, ALM, internet of things, etc)) impact on your workforce- size, training and future recruitment needs?*

*What impact do you think Brexit is likely to have on your workforce and plans for recruitment?*

### **Theme 5- Taking Forward an Energy Skills Plan for New Anglia**

*What are the top overall priorities that a 'Skills Plan' for Energy should capture and what role would they wish to have in supporting the plan's forward delivery?*

**List of Consultees**

A series of key interviews were conducted with a mix of employers, sector skills providers and representative bodies. In total over 40 consultees were interviewed in depth and/or attended the meetings held or provided other direct input (presentations at events, referrals, links to reports etc). These consultees included:

1. Gary Jefferson, West Suffolk College
2. Nikos Savvas, West Suffolk College
3. Ferlin Quantrill, East Coast College
4. Steve Rose, SSE
5. Matt Knights, ECITB
6. James Costello, MAERSK Training
7. Graham Hacon, 3Sun
8. Windcats- SNS Conference
9. Siemens- SNS Conference
10. Simon Gray, EEEGR
11. Gemma Head, EEEGR
12. Johnathan Reynolds, Nautilus Consulting
13. Celia Anderson, Statoil
14. Sue Falch-Lovesey, Vattenfall
15. Victoria Sinclair, ScottishPower Renewables
16. Guy Hazelhurst, EDF Energy
17. Dug Harrison, NSA Nuclear
18. Jan Feeney, Norfolk County Council
19. Natasha Waller, Skills Board
20. Michael Gray, Suffolk County Council
21. Paul Warmington, Energy Development Coordinator
22. Mark Goodall, Aker Solutions
23. Nick Ford, Fraser Well Management
24. Andy Beasley, Flow Energy Group
25. Stuart Smith, People for Energy
26. Yvonne Mason, icanbea...
27. Reuben Overmark, ECITB
28. Hayley Coe, CITB
29. Martyn Johnson, ECITB
30. Andy Whilding, UEA
31. Maddie Coupe, NALEP
32. Alex Frost, NALEP
33. Kerry Dunham, Norfolk County Council
34. Dayle Bayliss, Consultant
35. Sarah Mower, Flow Energy
36. Colin Ross, survey respondent
37. Paul Collins, Fraser Well Management
38. Dhian Ubhi, survey respondent
39. Graham Newman, Pruce Newman
40. Cheryl Willis- East Suffolk Councils

## Appendix B- Energy Evidence Report (Datapack Summary)

### Key Findings from the Data Analysis (please refer to the Datapack):

- Both GVA and employment have grown since 2010 but at a much slower rate than the averages for the New Anglia economy. This trend over a five-year period also masks large drops in employment and GVA between 2014 and 2015.
- In total, 500 learning aims related to the Energy sector were delivered to New Anglia residents in 2012/13. This formed 0.2 per cent of all known learning aims delivered in New Anglia, compared to 0.3 per cent nationally.
- Since 2010/11, there has been a 46 per cent decrease in the number of Energy learning aims delivered to New Anglia residents. Nationally, learning aims for the sector decreased by 12 per cent.
- The sector is projected to grow in employment terms between 2014 and 2024 by around 16 per cent (approximately 1,200 jobs).
- In addition, replacement demand is expected to be somewhere in the region of 3,000 jobs. This places a net requirement for jobs requiring to be filled in the sector at over 4,000.
- New jobs creation (expansion demand) will be primarily in roles requiring degree level skills and higher (Level 4 and above) with job losses in lower skilled roles. This trend can be seen in changes in qualifications in the sector between 2001 and 2011.

In terms of Gross Value Added (GVA) - in 2015 the sector was worth approximately £941m, which equates to 2.6 per cent of the total New Anglia economy. This is an increase of £61m on 2010 (seven per cent), much less than growth across the whole economy (17 per cent), and also masks a drop in GVA between 2014 and 2015 of over £300m.

In total, the sector currently employs 7,800 people (***please note the specified sector scope and definition omits broader supply-chain markets particularly across construction and engineering areas which are pertinent to key elements of the Energy Sector***), which is approximately one per cent of the workforce. Employment numbers in 2015 are nearly 300 more than they were in 2010 (an increase of four per cent). Over the same period employment across New Anglia grew by seven per cent. Again, between 2014 and 2015 employment in the sector also fell, by around 1,100.

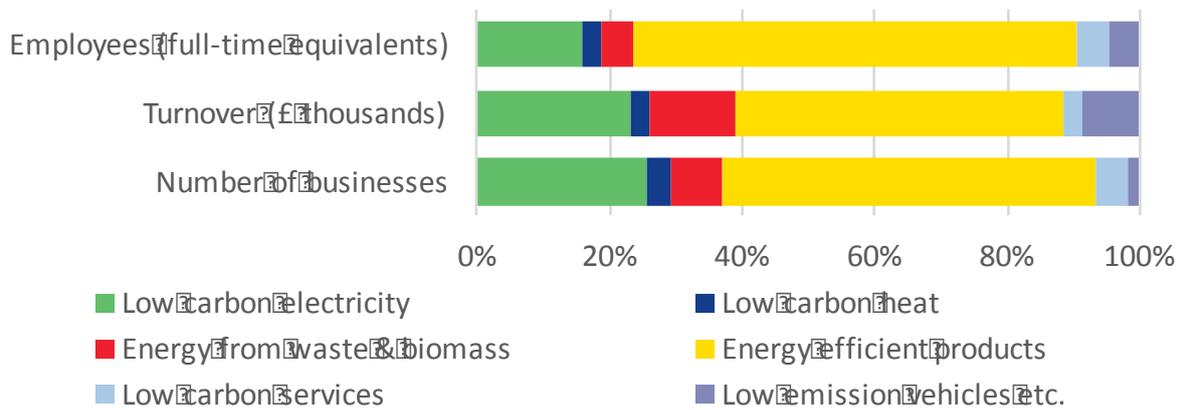
The largest sub-sector in employment terms is that of 'Electricity generation, storage and transmission (incl. fuels, nuclear, offshore, biomass etc.)' with 2,600. This is followed by 'Trade, wholesale, and retail of energy and fuels' with 1,300.

Overall the Energy sector is much more geared towards full-time employment, with 83 per cent of employment in the sector is full-time compared to 57 per cent across the whole economy.

In terms of enterprise numbers, as of 2016 there were 400 Energy enterprises operating in the New Anglia area, or 0.7 per cent of all enterprises. Since 2010 the number of Energy enterprises has increased by 90, or 28 per cent, much higher than the total New Anglia rate of growth (nine per cent) though these increases are from a low base.

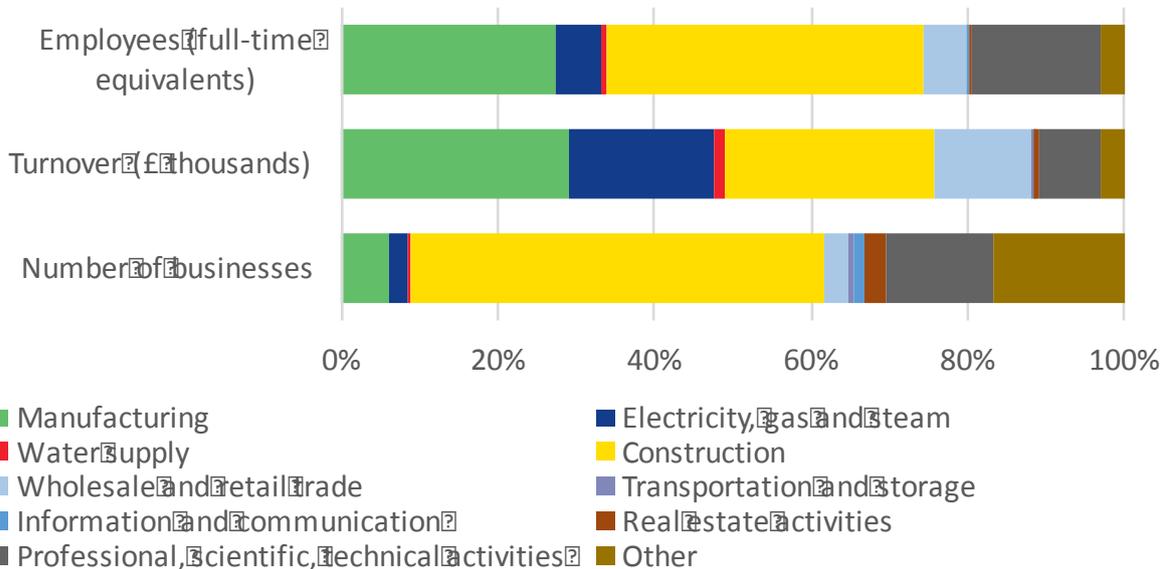
In terms of Low Carbon Renewable Energy (LCRE) the following chart shows how the amounts of employees, turnover, and businesses, are split over the six LCRE groups, and is a reasonable proxy for the splits we could expect at the local level.

**National proportions of employees, turnover and businesses by Low Carbon and Renewable Energy Group, 2014**



The next chart shows how LCRE economy employees, turnover, and businesses, are split over the broad industrial groups, and is again a reasonable proxy for the splits we could expect at the local level.

**Low Carbon and Renewable Energy industrial activity, 2014**



*Other includes Agriculture, forestry and fishing; Mining and quarrying; Accommodation and food service activities; Administrative and support service activities; Public administration and defence; compulsory social security; Education; and Other activities.*

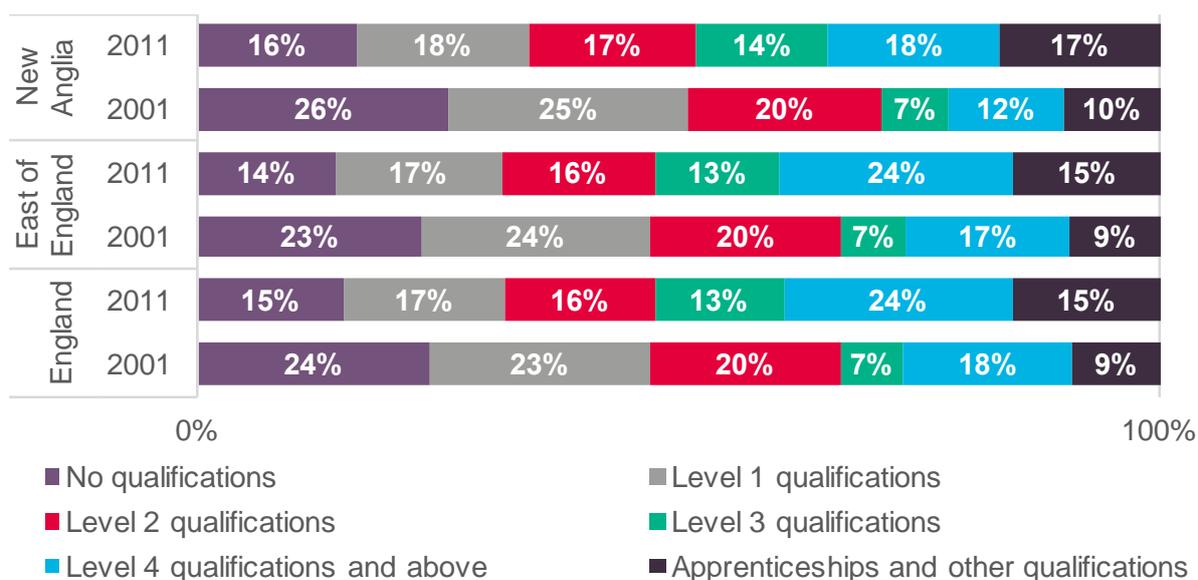
The very recent production of these estimates provided by the LCRE Economy Survey means that we are unable to produce any long term or meaningful trend data for employment, business numbers, and value created in the sector but if further surveys are carried out by the Office for National Statistics and the results published then we will be able to update this analysis. In the meantime, we can look to refer to extracts from the Renewable Energy Planning Database<sup>15</sup> (REPD) and compare the earliest version of it (October 2014) with later versions in order to gauge the number of LCRE projects either waiting or under construction, or in operation.

National trends on the use of renewable energy sources as a measure of growth within the sector nationally can also give us an indication of the sectors growth. The 2016 Digest of UK Energy Statistics<sup>16</sup> tells us that the percentage of energy coming from renewable and waste sources (such as wind, hydro power and biomass) has risen from 1 per cent of total UK energy consumption in 1998 to 9 per cent in 2015. This is against a backdrop of a 17 per cent fall in the amount of energy used by the UK between 1998 and 2015. This may be explained by:

- the increased use of energy-efficient technologies by households and firms
- government policies designed to reduce energy consumption
- a decline of UK manufacturing, especially in energy-intensive industries

### Energy Sector Skills Supply and Demand

It is worth noting that much like the overall population in New Anglia, the Energy workforce in New Anglia is becoming higher skilled as analysis of 2001 and 2011 Census data shows below (using the sector definition of 'Mining and quarrying, manufacturing, and electricity, gas and water supply'). In terms of this shift in qualifications, New Anglia has just outperformed regional and national averages for the sector.



<sup>15</sup> Department for Business, Energy and Industrial Strategy (BEIS)

<sup>16</sup> Department for Business, Energy and Industrial Strategy (BEIS)

*The following analysis is based on data sourced from the Department for Education's Further Education data library. The Sector Lead Bodies identified as being the most relevant to the Energy Sector are: Chemicals, Life sciences, Pharmaceuticals, Nuclear, Oil, Gas, Petroleum, Polymer; Energy & Utility; and Engineering Construction Industry.*

In total, 500 learning aims related to the Energy sector were delivered to New Anglia residents in 2012/13. This formed 0.6 per cent of all known learning aims delivered in New Anglia, compared to 0.8 per cent nationally. If we consider all learning aims delivered (i.e. including those classed as 'unknown' then these figures fall to 0.2 and 0.3 per cent respectively).

Compared to 2010/11, when the number of learning aims delivered to New Anglia residents was 920, then numbers are down across all sector lead body elements of the Energy sector apart from 'Engineering Construction Industry' where learning aims increased from 70 to 100. Overall, this results in there having been a 46 per cent decrease in the number of Energy learning aims delivered to New Anglia residents over the period in question. Nationally, and over the same period, learning aims for the sector decreased by 12 per cent.

The vast majority of these learning aims (330 or 66 per cent) achieved by New Anglia residents were delivered by external providers. The average for New Anglia for external provision is 25 per cent.

Provision of Energy sector learning aims by New Anglia providers to New Anglia residents has decreased over the time period in question, from 340 down to 170. The decline has been driven by the element of 'Energy & Utility', decreasing from 210 learning aims delivered to 30, a drop of 86 per cent.

In terms of apprenticeships- in 2014/15 there were 30 starts in apprenticeship frameworks in New Anglia covering 'Engineering Construction' (10), 'Sustainable Resource Management' (5), 'The Gas Industry' (5), 'The Power Industry' (5), and 'The Water Industry' (5). This number has remained largely unchanged since 2011/12.

Data on apprenticeship participation by sector provides a slightly different perspective with the Energy sector (consisting of 'Mining and Quarrying', 'Electricity, gas, steam, and air conditioning supply', and 'Water supply, sewerage, waste management and remediation activities') accounting for 0.4 per cent (100) of all apprenticeship participation in 2014/15, which is lower than the level of employment it provides (one per cent). Nationally, apprenticeship participation in the sector accounted for 0.9 per cent of all apprenticeships.

Consultation with SSE highlighted their engagement with the Engineering Maintenance apprenticeship provision (RQF 3) through East Coast College (to provide Performing Engineering Operations (PEO) technical capability), with an uptake of around 6 apprentices per year.

*Analysis of LEP level results for the Energy sector from the UKCES Employer Skills Survey 2015 due to the small number of responses at this level and subsequent suppression of results on the basis of accuracy.*

The following makes use of data and findings available via the online toolkit <http://wheretheworkis.org/>. The findings presented are a result of combining data from the UKCES 'Working Futures' programme and job vacancy data from the Labour Market Insight tool developed by Burning Glass.

In this instance, the closest occupation relevant to the Energy sector is that of 'Science, Engineering and Production Technicians'. Please note that this occupation was also included in analysis for the Advanced Manufacturing and Engineering sector.

Advertised salaries for the role in New Anglia were generally lower than those advertised regionally and nationally. In the case of nationally, then £9, 00 less per year.

Of the 730 roles advertised in New Anglia during 2015 then the majority were geared towards FE level skills (45 per cent). However, HE level roles also featured strongly at 31 per cent and there were also opportunities for school leavers with 24 per cent.

### A Future View of the Energy Sector

Looking ahead and using information from both the East of England Forecasting Model, and the UKCES Working Futures model, then the sector is projected to increase in employment terms between 2014 and 2024 by around 16 per cent (approximately 1,200 jobs). These new jobs will primarily be in positions requiring Level 4 to 6 (HE to First degree level) skills / qualifications and above though some will be at Level 2.

Over the same period, approximately 3,000 existing jobs will need replacing as people leave the sector workforce. Much of this replacement demand is centred on Level 3 (A level and equivalent) roles and higher though there is a sizable element of replacement demand across all roles. In total, projected expansion and replacement demand places a net requirement for jobs requiring to be filled in the sector at over 4,000.



## Appendix C- Current Skills and Training Provision

The current skills offer for the sector is broadly distributed across the engineering, manufacturing and construction fields. Apprenticeships that contribute towards a career pathway within the sector also predominantly fall within existing frameworks aligned to these broader programme areas. EEEGR lists one specific 'energy industry' apprenticeship programme within its Education Pathway prospectus (Skills for Energy, EEEGR, 2017):

- ECITB accredited Level 3 in Engineering and Construction (up to 4 years)- delivered through East Coast College;

In addition, EEEGR and ECITB promote access to a 4-year Oil and Gas Technical Apprentice Programme (OGTAP) delivered initially out of area via accredited OPITO training. EDF Energy also offers an Engineering Maintenance Apprenticeship Scheme Level 3 over a four-year duration.

There is a relatively small but important overtly 'energy' specific cluster of provision at FE and HE levels on offer across New Anglia, captured below.

Course	Availability	Details
Level 2 Energy Skills Foundation Project	East Coast College	A foundation programme linked to some of the core disciplines within the sector, which has been endorsed by EEEGR, involving-welding, mechanical engineering and engineering construction activities. The year long course includes site visits and features strong employer support;
Level 3 Energy	East Coast College	A 1-year full time progression from the Level 2 foundation course with more detailed energy related training across the engineering and construction areas;
Advanced Petroleum (Oil) Tanker Training	East Coast College	A 5-day course focusing on oil tanker operations and environmental/health hazards-leading to an MCA approved certificate;
Tanker Familiarisation (Oil/Gas)	East Coast College	A 3-day course focusing on the hazards in petroleum, chemical and liquid gas transportation;
Offshore First Aid + refresher (HSE Approved)	East Coast College	A 4-day course that complies with the Offshore Installations and Pipeline Works (First Aid) regulations 1989;
Offshore Installation Manager Controlling Emergencies	East Coast College	a 5-day emergency planning training course assessed against pre-agreed OPITO endorsements;
Offshore Wind Farm Navigational Awareness	East Coast College	A 1-day course for marine coordinators, technicians, control room personnel and offshore wind managers to improve their knowledge and awareness of the conditions

Course	Availability	Details
		that crew transfer vessels and work vessels encounter when working within offshore wind farms;
Offshore Wind Emergency Management and Emergency Response	East Coast College	Short duration bespoke training based on client needs;
Offshore and Oil/Gas Assessor Training	East Coast College	
BEng Energy Engineering with Environmental Management	University East Anglia	An Energy Institute accredited 3-year full time course developed in partnership with EEEGR that builds on a common first year 'foundation' stage with pathways covering energy, mechanical, electronic and electrical (plus a mixed approach);
BEng Energy Engineering	University East Anglia	An Energy Institute accredited 3-year full time course developed in partnership with EEEGR that focuses on core engineering, maths and principles with later specialisms for nuclear, bio energy, environmental awareness;
MEng Energy Engineering	University East Anglia	An Energy Institute accredited 4-year full time course developed in partnership with EEEGR that focuses on core engineering, maths and principles with later specialisms for nuclear, bio energy, environmental awareness;
MSc Energy Engineering with Environmental Management	University East Anglia	A 1 year post graduate course combines investment in engineering with existing and substantial expertise across the Faculty of Science in the fields of applied mathematics, energy resources, environmental management and electronic engineering.

Beyond the energy specific courses on offer is a broad training pathway, mainly across FE and heavily oriented towards electrical, maintenance and manufacture engineering, an aggregated 'cross-section' of the training offer is captured below, which includes the related apprenticeship frameworks.

Discipline	Programme Overview	Availability	Typical Awards
Engineering	Basic Engineering Skills Maintenance and Installation Electrical Technicians (inc operations and maintenance) Extended Engineering	East Coast College West Suffolk College City College Norwich College of West Anglia	Apprenticeship Level 2-3 Level 1-3 Level 3 Extended Diploma Foundation Degree HND HNC Degree+

Discipline	Programme Overview	Availability	Typical Awards
	Installation and Commissioning Technical Development Operations Engineering Civil Engineering	Suffolk New College University of Suffolk	
Engineering Manufacture	Welding and Fabrication Skills Manufacture Engineering Mechanical Manufacturing Performing Engineering Operations- Welding, Manufacturing, Machining	East Coast College West Suffolk College City College Norwich Suffolk New College Norfolk Training Services	Apprenticeship Level 2-3 Level 1-3 Level 3 Extended Diploma
Electrical	Installing Electro technical Systems Electrical Installation	West Suffolk College College of West Anglia	Level 1-3 Level 3 Extended Diploma
General	Bridge to Technology	College of West Anglia	NPTC Certificate

It is also worth noting that the above lists mainly capture the RQF accredited and FE short course delivered provision however there are a number of organisations operating within the sector that delivery technical training stationed within region or able to train peripatetically outside of region:

- **3sun-** through their purpose-built site at Great Yarmouth they offer both bespoke and off the shelf training solutions primarily aimed at the oil, gas and offshore wind industries. This includes- health and safety, working at height, hose management, hydraulic awareness, small bore tubing and forklift training.
- **Petans-** based in Norfolk offer training linked to maritime, helideck training, GWO initial and refresher Basic Safety Training, confined spaces training and first aid.
- **C-Wind-** specialise in the offshore wind industry, with a focus on health and safety, rescue training and equipment advice.
- **HETAS-** biomass installer training (located in Sudbury, Suffolk).