GREEN SKILLS INFRASTRUCTURE REVIEW FOR ESSEX

Essex County Council

March 2022

Essex County Council

Essex Climate Action Commission
Powering positive change

mace

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“The climate crisis is both a problem and opportunity. It requires fast action; it also requires investments in new skills and businesses for the green economy to emerge and grow. The Essex Climate Action Commission welcomes this report. It shows there is likely to be substantial growth in green jobs within the economy of Essex in the next ten years, helping to make the transition towards net zero for the whole county.”

Professor Jules Pretty, Chair of Essex Climate Action Commission (ECAC)

“Essex’s transition to a green economy requires a workforce with the right skills, at the right time. This means that businesses, training providers, funding bodies, local authorities and others must work together in identifying potential partnerships and actions to best align green skills supply and demand in the county. Therefore, I am delighted to see the recommendations in this review of Green Skills Infrastructure in Essex with a clear focus on collaboration required to lead us to a sustainable future. This will complement and influence our ambitions in the Essex Skills Plan and skills development partnership work in the future.”

Councillor Tony Ball
Cabinet Member for Education Excellence, Skills and Training

EXECUTIVE SUMMARY

Following a recommendation from the Essex Climate Action Commission (ECAC), Essex County Council has commissioned Mace to undertake a review of green skills and related infrastructure in the county.

The work has been undertaken between September and November 2021 using a mixture of desk-based research and stakeholder engagement. The beneficiaries of this study are the residents, businesses and training/education providers located within the geographical county of Essex. The work has refined a definition of green skills:

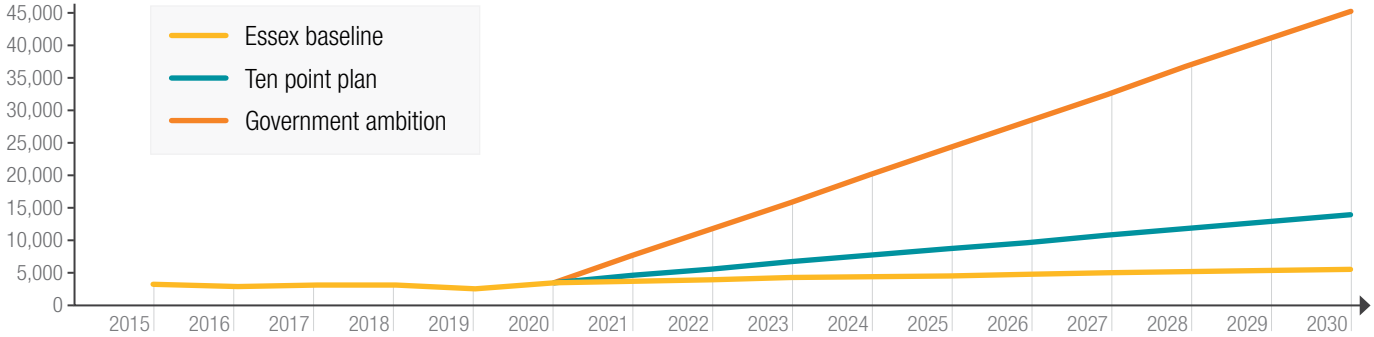
Green skills are knowledge, experience, values, attitudes and abilities that support carbon reduction and resource efficiency to increase climate resilience and enhance natural assets.

Green skills do not form their own sector, they are relevant to all sectors in the economy.

Demand for green skills in Essex

- Where green skills are the core function of the job role, or 'directly green', it is estimated that there are currently around 3,000 – 4,000 green skilled jobs in Essex. Three scenarios of future green skills demand have been predicted to 2030:
- A baseline prediction based on the historic growth of green skills in Essex results in approximately **5,750** directly green skilled jobs in Essex by 2030.
- Future growth based on the government's Ten Point Plan for a Green Industrial Revolution is estimated to deliver around **14,000** Essex green skilled jobs by 2030.
- Should the government's stated ambition of creating 2 million UK green jobs by 2030 be realised, the contribution by Essex is estimated to be **45,000** green jobs.

Predicted growth in green skilled jobs in Essex



These demand scenarios assume that Essex broadly retains its current proportions of directly green jobs, but it is also recognised that for every new directly green job, there will also be a ripple effect of supporting jobs created, e.g. recruitment, HR, administration etc. At present it is unclear which industries will grow more or less rapidly based on geographic or political drivers in Essex, and this represents an interesting future research opportunity.

Provision of green upskilling

A review of the provision of education and green upskilling opportunities has identified:

- Further Education data, including classroom and apprenticeship training where the student's home postcode is in Essex, shows 47,740 enrolments in 2020/21 in subject areas relevant to green skills.
- Higher Education data shows 44,015 undergraduate and postgraduate places taken up in the three Essex universities in 2019/20.
- Adult Community Learning (ACL) Essex had 12,991 active learners in 2017.

Combined, the above opportunities equate to over 100,000 learning places available in Essex each year with further employer and industry led upskilling opportunities also available.

This shows that, in theory, there is good capacity of classroom and apprenticeship upskilling opportunities to service the predicted growth in green skills, however this is dependent on the learning opportunities being aligned to relevant green skills needs.

It is therefore essential that those responsible for funding and providing education and upskilling opportunities rapidly understand the emerging needs for green skills in order to direct courses and curriculum towards the right areas.

Identified gaps and challenges

Policy implementation	**Data availability**
Awareness	**Communication**
Education	**Resources**

The Joint Stakeholder Action Plan brings together the recommendations from this study under 4 headings.

1. **The Essex Net Zero Centre of Excellence**
   - An online access to a hub of experts and expertise for both individuals and businesses to utilise.
2. **Raising Awareness**
   - Five communication tools to increase the speed of information flow between stakeholders to support the increase in demand and supply of green skills.
3. **Strategic Leadership**
   - Four targeted leadership actions to provide more certainty in the demand for green skills and create data to boost progress.
4. **Collaboration and Partnership**
   - A drive for more collaboration and partnership to discuss and promote green skills in Essex.

1 INTRODUCTION

1.1 Introduction

Following a recommendation from the Essex Climate Action Commission (ECAC), Essex County Council has commissioned Mace to undertake a review of green skills and related infrastructure in the county. This review set out to:

- Identify skills gaps and business needs
- Review the capacity of existing providers and growth plans
- Collate evidence of good practice
- Document potential development opportunities
- Create a joint Stakeholder Action Plan identifying resources and next steps

The outcomes identify how existing or improved skills infrastructure can support ECAC's ambition to mitigate the effects of climate change, improve air quality, reduce waste across Essex and increase the amount of green infrastructure and biodiversity in the county.

This work has adopted an evidence-based approach. In some instances, insufficient data was available to fully evidence findings in quantitative terms. The report recommendations detail the areas where enhanced data collection and dissemination is required.

1.2 Approach

The work has been undertaken between September and November 2021 via a mixture of desk-based research and stakeholder engagement.

The priority areas that have been covered are:

- Refining a definition of green skills for Essex and quantifying the current levels of greens skills in the county (Section 3)
- Reviewing policy and other drivers that will increase the demand for green skills and estimating how this will affect future demand in Essex leading up to 2030 (Section 4)
- Reviewing the provision of green upskilling in Essex and how this is aligned to demand (Section 5)
- Identifying gaps, challenges and best practice (Section 6)
- Developing recommendations and presenting these as a Joint Stakeholder Action Plan (Section 7)

1.3 Essex

The intended beneficiaries of this study are the residents, businesses and training / education providers located within the geographical county of Essex (including Southend-on Sea and Thurrock). It is also recognised that adjacent or national centres of importance can deliver skills provision that is easily accessible from within the county, and therefore where appropriate, these have also been considered in the review.

Throughout the stakeholder consultation and Essex specific literature, several references have been made to Essex being a county of Small and Medium sized Enterprises (SME's) with a smaller proportion of large businesses, however, the most recent available data shows consistency with other areas. The 2021 ONS[1] data in Table 1 shows that the breakdown of businesses by size in Essex is well aligned to regional and national averages.

Figure 1 Geographic county of Essex

Table 1 Enterprises by size

Enterprises	Essex (number)	Essex (%)	East Region (%)	England (%)	UK (%)
Micro (0-9)	60,205	90.2	90.1	89.8	89.7
Small (10-49)	5,405	8.1	8.1	8.3	8.4
Medium (50-249)	920	1.4	1.5	1.5	1.5
Large (250+)	180	0.3	0.3	0.4	0.4
Total SME	66,530	99.7	99.7	99.6	99.6
Total	**66,715**		Source: ONS Inter Departmental Business Register (2021)		

[1] ONS (2021), 'Labour Market Profile (Essex) Employee Jobs [by industry] (2020), NOMIS office labour market statistics [online] available at: Link [08.10.2021]

Landscape and location

Stakeholders frequently referred to Essex as a green county during the consultation and this view is supported by the Essex Green Infrastructure Strategy which indicates that there is 782 Km² of green infrastructure in Greater Essex (21% of the total county area), with an additional 2,240 Km² (61%) characterised as 'productive spaces' (e.g., agriculture land)[2]. Supporting and enhancing green infrastructure is the key vision outlined in the Essex Green Infrastructure Strategy.

Essex also has one of the country's longest coastlines stretching for over 300 miles, which has been identified in the Essex Green Infrastructure Strategy (2020) to provide opportunities for multifunctional green infrastructure projects which can offer restoration, enhancement, connection and protection of watercourses and coastal areas enabling environmental, economic and social benefits.

The county of Essex is also advantageously located close to Greater London, with the south-west section of the county bordering several London boroughs. This provides greater opportunity to forge a close relationship with the City, and government bodies.

[2] Essex County Council (2020). 'Essex Green Infrastructure Strategy', [online] available at: Link [11.01.2022]

2 INFORMATION SOURCES

2.1 Approach and data sources

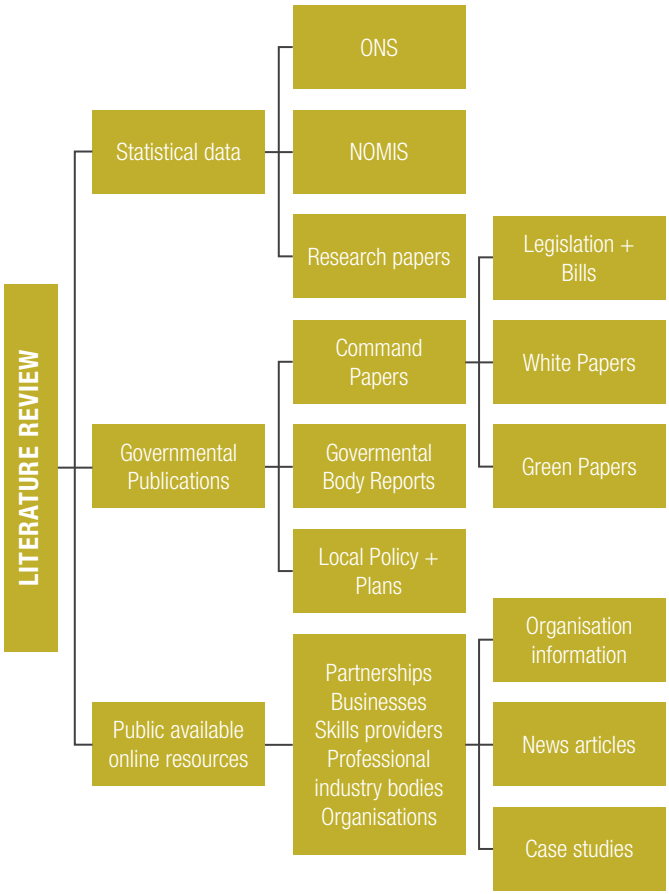
An extensive review of the pertinent literature has been undertaken to understand the available data and perspectives on green skills. The desktop-based research has also been combined with information from stakeholders via 35 engagement sessions. These two lines of enquiry have sought to:

- Refine a definition of 'green skills', through understanding how key stakeholders define green skills and what they consider are the priority green skills for Essex.
- Assess the scope and outcomes of green skills related research that has been carried out by others to date, in order to build upon, not reinvent.
- Evaluate the successes and failures of measures that have previously been implemented, with the intention of enhancing green skills within the workforce, and to understand best practice which could be applied to the County of Essex.
- Identify current and upcoming policies and legislation that may affect green skilled roles and assess how this may affect their demand for green skills.
- Understand the characteristics of Essex County to develop appropriate recommendations that are suited to Essex and its communities.

2.2 Literature review

Figure 2 shows the key sources of information which have been identified by establishing key themes relevant to the study. For example, new large-scale developments in the next decade will influence the skills demand in Essex.

Figure 2 Literature review – sources map



Following Net Zero 2050 being written into legislation, many industries, government and local governments, sector organisations and partnerships, Think Tanks and independent researchers have been considering how economic operations and businesses will need to adapt to meet the 2050 target, and how this will influence the requirement for a green skilled workforce. Many have published reports of their findings, and these have been considered in the development of this report's recommendations. The purpose of the literature review has been to identify existing research and provide recommendations that build upon current thinking and improvement proposals.

2.3 Stakeholder engagement

For the purposes of this review, Stakeholders that may be affected by the report outcomes have been identified by Essex County Council, Mace and through the stakeholder engagement itself. The Stakeholders have been informed of the project and given the opportunity to express their interest, concerns, views and recommendations for consideration. Stakeholders had also been given the opportunity, by ECC, to comment on the original scope of this review. A full list of Stakeholders has been provided in Appendix A.

Stakeholder engagement sessions have been hosted online via Microsoft Teams throughout September – November 2021, which have included some one-on-one sessions and group sessions, with Stakeholders from a mix of sectoral backgrounds.

A set of key questions have been used to provoke a discussion around green skills in Essex and establish the priorities of the Stakeholders. These can also be found in Appendix A.

The Stakeholder feedback from the engagement sessions (see Appendix A) has highlighted key themes and issues that are considered priority areas of focus for enhancing green skills within Essex and these have been explored further in the following sections of this report.

3 DEFINITION OF GREEN SKILLS AND CURRENT LEVELS

3.1 Approach and data sources

There is no single universally agreed definition of 'green skills'. During this review, previously published definitions were considered alongside stakeholders' priorities for Essex in developing the following definition:

Green skills are knowledge, experience, values, attitudes and abilities that support carbon reduction and resource efficiency to increase climate resilience and enhance natural assets.

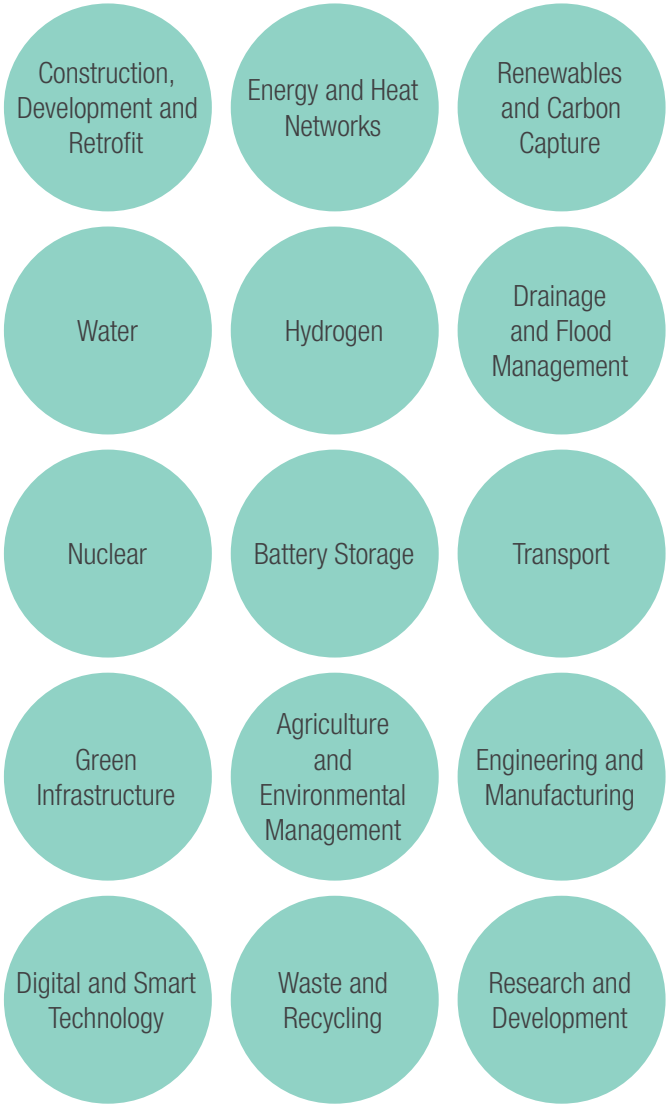
Green skills do not form their own sector, they are relevant to all sectors in the economy.

The definition above has been refined for this review and complements several alternative definitions that have been published by other bodies. It runs alongside the Organisation of Economic Cooperation and Development's (OECD) definition[3] of 'Green Growth':

"fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services which our wellbeing relies".

The sectors, industries and activities that have been referenced most in the literature and stakeholder engagement for this study are shown on the diagram to the right.

Figure 3 Green skills common themes, denoting a mix of sectors, industries and activities



[3] OECD (2021), 'Green growth and sustainable development', OECD Better Policies for Better Lives [online] available at: Link [18.11.21]

3.2 Characterisation of green skilled jobs

The transition to a net zero economy will influence every occupation either directly or indirectly, with green skills becoming embodied across UK sectors and industries. This creates a challenge when trying to quantify the prevalence of green skills. It also creates a challenge in identifying and quantifying relevant transferable skills.

The recent report[4] 'Are 'green' jobs good jobs?' stresses the need to characterise and quantify the growing green economy. The report draws on research[5] carried out by the U.S. programme 'Occupation Information Network' (O*NET), who have distinguished between green skilled occupations, based on the differing consequences that the transition to a net zero and sustainable economy has on occupational performance:

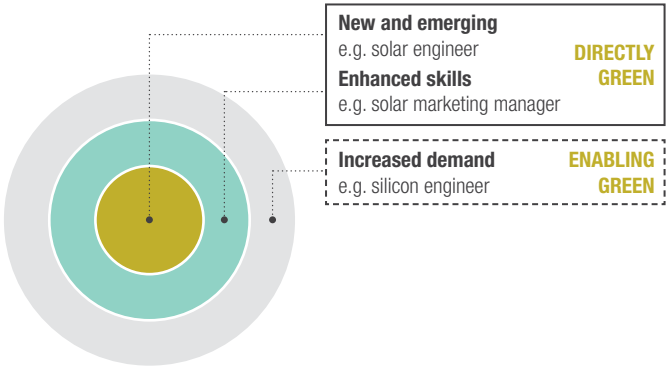
a. **New and emerging green skilled jobs:** The transition to a low carbon economy leads to the creation of new occupations with unique tasks and worker requirements that are directly green in nature (e.g. electric vehicle designers and manufacturers).

b. **Enhanced green skilled jobs:** The transition to a low carbon economy significantly alters tasks, skills and knowledge requirements for these occupations (e.g. mechanics requiring new skills in electric vehicle maintenance and repair).

c. **Increased demand green skilled jobs:** The impact of sustainable economy activities and technologies increases the employment demand for an existing occupation. However, this impact does not entail significant changes in the work and worker requirements of the occupation. The work context may change, but the tasks themselves do not (e.g. increased demand for electrical engineers and power line installers to supply low carbon electricity to substations which feed into electric vehicle charging points).

These three levels provide a useful classification when we consider existing and potential future demand for green skills.

Figure 4 Varying greenness of job categories (adapted from 'Are 'green' jobs good jobs?' – Oct 2021)



[4] Valero A, Li J, Muller S et al, (Oct 2021) 'Are 'green' jobs good jobs?' Grantham Research Institute on Climate Change and the Environment, Centre for Economic Performance, London School of Economics and Political Science [online] available at: Link [19.11.21]

[5] Dierdorff E, Norton J, Drewes D et al, (Feb 2009) 'Greening of the World of Work: Implications for O*NET®-SOC and New and Emerging Occupations', O*NET [online] available at Link [19.11.21]

3.3 'Directly Green' skilled jobs in Essex

Three sources of information have been combined to quantify the current level of directly green jobs in Essex:

ONS Low carbon and renewable energy economy estimates (LCREE)[6]. Annual estimates of low carbon and renewable energy activity in the UK economy. Questionnaires are sent to a sample of businesses asking for the number of Full-Time Equivalent employees supported (FTEs) operating in any of the 17 LCREE industries (See Appendix B for a full list of SIC codes used). In addition to the 17 industries data is provided for 14 sectors. Data is only provided at a UK level, annually for years 2014 – 2019 (2015 – 2019 used for this report).

NOMIS Labour market profile (Essex) Employee jobs by industry[7]. The number of jobs in Essex annually for 2019 by 18 sectors. Sectors match the LCREE data above enabling cross-reference.

ONS JOBS05: Workforce jobs by region and industry (published 14 Sept 2021)[8]. Dataset provides a breakdown of UK jobs by 20 sectors. These 3sectors match the sectors in the two datasets above to enable cross referencing.

The provision of green jobs in Essex was estimated by:

1. Calculating the proportion of 2019 UK jobs that were in Essex, by sector
2. Applying Essex proportion to the 2019 LCREE dataset, by sector

The results show that in 2019 Essex was supporting 2,933 green skilled jobs.

[6] ONS (July 21), 'Low carbon and Renewable Energy Economy (LCREE) Survey QMI' [online] available at: Link [08.10.21]

[7] ONS (2021), 'Labour Market Profile (Essex) Employee Jobs [by industry] (2020), NOMIS office labour market statistics [online] available at: Link [08.10.2021]

[8] ONS (Sept 2021), 'JOBS05: Workforce jobs by region and industry' [online] available at: Link [08.10.2021]

Table 2 Estimated directly green skilled jobs in Essex 2015 – 2019 by industry

Industry	2015	2016	2017	2018	2019
Alternative fuels	65	63	-	11	7
Bioenergy	79	62	121	127	95
Carbon capture and storage	-	-	-	-	2
Energy efficient lighting	449	715	454	361	481
Energy monitoring, saving or control systems	214	298	249	255	166
Fuel cells and energy storage	7	56	17	33	14
Hydropower	6	20	14	11	9
Low carbon financial and advisory services	147	5	176	66	74
Low emission vehicles and infrastructure	207	156	151	197	242
Nuclear	88	45	49	89	174
Offshore wind	39	82	95	101	102
Onshore wind	114	97	53	61	52
Other energy efficient products	1,553	1,372	1,608	1,777	1,328
Other renewable electricity	-	-	5	3	5
Renewable combined heat and power	10	29	2	10	8
Renewable heat	46	62	77	85	65
Solar photovoltaic	167	62	84	109	111
Essex Total	**3,192**	**3,123**	**3,155**	**3,297**	**2,933**

Source: NOMIS and ONS

Table 2 shows that the greatest number of green skilled jobs are in the 'Other energy efficient products' industry. When cross referencing with other attributes in the data, it is found to be driven by activity the Construction and Manufacturing sectors.

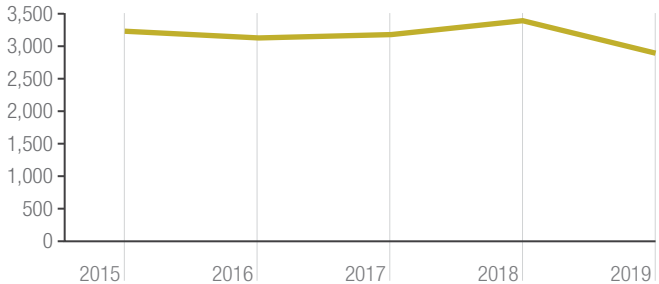
Table 3 Estimated directly green skilled jobs in Essex 2015 – 2019 by sector

Sector	2015	2016	2017	2018	2019
a. Agriculture, forestry and fishing	9	-	-	7	9
b. Mining and quarrying	-	-	-	-	-
c. Manufacturing	1,015	1,034	979	1,175	912
d. Electricity, gas, steam and air conditioning supply	14	9	23	23	19
e. Water supply; sewerage and waste management	81	93	46	58	46
f. Construction	1,395	1,399	1,574	1,570	1,234
g. Wholesale and retail trade; repair of motor vehicles	142	245	107	21	146
h. Transportation and storage	3	3	-	-	-
i. Information and communication	1	5	3	4	15
j. Real estate activities	3	3	7	2	2
k. Professional, scientific and technical activities	446	291	330	366	388
l. Administrative and support service activities	37	40	79	65	133
m. Education	46	-	5	5	29
n. Other activities	-	-	2	-	-
Essex Total	**3,192**	**3,123**	**3,155**	**3,297**	**2,933**

Source: NOMIS and ONS

The total number of directly green skilled jobs in Essex shows an upward trend in the most recent years, except for 2019 where a drop is observed. It is unclear why this reduction occurs, but it could be due to variability introduced through collecting data via questionnaire during the COVID-19 pandemic.

Figure 5 Estimate of the total number of green skilled jobs in Essex 2015 - 2019



3.4 Proportion of new jobs

The transition to a low carbon economy will require new employees entering the workforce with educational background and training in green skills. It will also require the re-skilling and upskilling for existing members of the workforce.

Not all of the green skilled job growth will be new jobs, there will be some decline in existing professions and associated re-skilling and upskilling of the existing workforce, for example:

- Car mechanics transitioning to focus on electric vehicles
- Gas boiler engineers transitioning to serve air source heat pumps and other low carbon alternatives

Most new jobs will be created in the 'Directly Green' category (as outlined in Section 3.2 above). As the green economy accelerates there will also be new 'Enabling Green' jobs created to bolster infrastructure or services that support decarbonisation. In addition, for every new 'Directly Green' job, there will also be a ripple effect of supporting jobs created, e.g. recruitment, HR, administration etc.

Section 4 below quantifies the future number of green skilled jobs in Essex using three growth scenarios. While we can accurately predict the likely growth in green skilled jobs, some uncertainty remains about the proportion of new jobs compared to levels of re-skilling / upskilling or potential decline of jobs within more carbon intensive industries.

The same is true for existing research. For example the LGA report Local green jobs - accelerating a sustainable economic recovery[9] provides a quantification of potential green jobs, however does not provide any estimation of the proportion of those jobs that will be new.

It is recommended that further research is undertaken to better understand the proportion of new jobs that will be created. This will help guide future planning of education / training provision ensuring the necessary skills are available in Essex to support the UK transition to a low carbon economy.

[9] LGA (2021), 'Local green jobs - accelerating a sustainable economic recovery [online] available at: Link [19.11.21]

4 SKILLS DEMAND

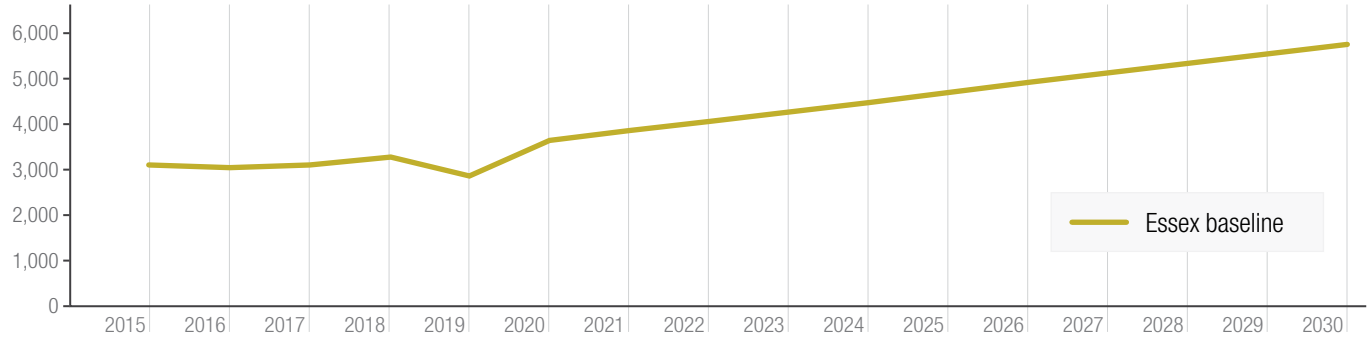
4.1 Baseline demand

The existing provision of green skilled jobs in Essex (presented in Section 3.3) has been used to create a baseline prediction of future demand which assumes a 'business as usual' scenario.

A linear regression analysis has been undertaken to predict the growth in future years based on historic trends. This assumes that the growth in green skills in Essex will continue at the same rate as previous years.

The result from this analysis shows that the demand for green skills will grow from 2,933 jobs in 2019 to 5,751 jobs in 2030, a rise of 2,818 (96%). If evenly spread this would equate to around 256 new jobs per year, as shown on Figure 6.

Figure 6 Predicted growth in green skilled jobs in Essex based on historic trends



This represents a baseline scenario, which does not account for accelerated growth resulting from policy, consumer demand and projects or infrastructure in Essex.

4.2 Drivers

Feedback from stakeholders and information presented in literature suggest the demand for green skilled jobs is likely to increase significantly across the UK and Essex. This is due to several key drivers, such as changes to legislation and policy and major investment in Net Zero. Some of the key drivers to the anticipated increase in the demand for green skills are outlined below.

More detailed information can be found in Appendix C.

Policy

The Ten Point Plan for a Green Industrial Revolution (2020)[10]

The Ten Point Plan sets out the government's approach to build back better, support green jobs, and accelerate the UK's path to Net Zero. The Ten Points that have been established as the key sectors for the 'Green Industrial Revolution' are shown on the right.

Net Zero Strategy: Build Back Greener (2021)[11]

In 2019 the UK Government committed to being 'net zero' for all greenhouse gas emissions by 2050. This policy document sets out key policies that have the potential to support up to 190,000 jobs by 2025, and up to 440,000 jobs by 2030.

Build Back Better: our plan for growth (2021)[12]

HM Treasury's 'Build Back Better' policy paper aims to tackle long-term problems to deliver growth that creates high quality jobs across the UK. There are three core pillars of growth for 'building back better' - Infrastructure, Skills and Innovation.

Heat and Buildings Strategy (2021)[13]

This strategy sets out how the UK will decarbonise its 30 million homes, and workplaces in a simple, low-cost and green way whilst ensuring this remains affordable for households. The government's ambition is to phase out the installation of gas boilers beyond 2035. This transition is expected to create new opportunities and support over 240,000 low-carbon jobs by 2035 across the sector (from manufacture, to installation and modelling, to project management).

POINT 1
Advancing offshore wind

POINT 2
Driving the growth of low carbon hydrogen

POINT 3
Delivering new and advance nuclear power

POINT 4
Accelerating the shift to zero emission vehicles

POINT 5
Green public transport, cycling and walking

POINT 6
Jet zero and green ships

POINT 7
Greener buildings

POINT 8
Investing in carbon capture, usage and storage

POINT 9
Protecting our natural environment

POINT 10
Green finance and innovation

[10] HM Government (Nov 2020), 'The Ten Point Plan for a Green Industrial Revolution' [online] available at: Link [19.11.21]

[11] HM Government (Oct 2021), 'Net Zero Strategy: Build Back Greener' [online] available at: Link [19.11.21]

[12] HM Treasury (Mar 2021), 'Build Back Better: our plan for growth' [online] available at: Link [19.11.21]

[13] HM Government (Oct 2021), 'Heat and Buildings Strategy', Dept. for Business, Energy and Industrial Strategy [online] available at: Link [19.11.21]

Environmental Act (2021)[14]

The recently passed Act will bring about the legal-binding targets to combat the environmental and climate crisis facing the UK. The targets will provide a long-term mechanism to deliver the government's 25 Year Environment Plan. The Act increases the pressure to deliver greater nature-based solutions, alongside green infrastructure on developments. This will enable mitigation and adaptation to climate change, whilst providing benefits for the health and wellbeing of the Essex population.

Skills and Post-16 Education Bill (2021)

Currently being debated, the Skills and Post-16 Education Bill will help to create more routes into skilled employment in sectors the economy needs such as engineering, digital and clean energy[15]. One of the main benefits of the Bill includes offering adults across the country the opportunity to retrain a Lifetime Skills Guarantee throughout their lives

Skills for Jobs: Lifelong Learning for Opportunity and Growth (2021)[16]

The UK Government launched this White Paper which recognises the skills gap within the UK. It sets out the new £2.5 billion National Skills Fund to enhance the funding to support adults to upskill and reskill.

Building Regulations: Approved Documents L and F and Overheating[17] / Future Homes / Buildings Standard (2025)[18]

The Future Homes Standard will ensure new homes built from 2025 will produce 75-80% less carbon emissions than homes delivered under current regulations. The standard will comprise a series of amendments to Part F (ventilation) and Part L of the Building Regulations for new homes, the release date of the updated Approved Document Part L is yet to be confirmed.

UK Digital Strategy (2017)[19]

This policy paper sets out how the UK will develop a world-leading digital economy that works for all. It has seven strands including: connectivity, skills and inclusion, the digital sectors, the wider economy, cyberspace, digital government and the data economy.

Revised National Planning Policy Framework (2021)[20]

The National Planning Policy Framework was revised on 20 July 2021 and sets out the government's planning policies for England and how these are expected to be applied. The revisions made align planning policy to Net Zero targets.

[14] UK Parliament (2021), 'Environmental Act 2021' [online] available at: Link [19.11.21]

[15] UK Parliament (Nov 2021), 'Skills and post Education Bill [HL]' [online] available at: Link [19.11.21]

[16] Department for Education (Jan 2021), 'Skills for Jobs: Lifelong Learning for Opportunity and Growth' [online] available at: Link [19.11.21]

[17] GOV.UK (Jan 2021), 'Building Regulations Approved Documents L, F and Overheating (consultation version)' [online] available at: Link [19.10.21]

[18] GOV.UK (Jan 2021), 'The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings' [online] available at: Link [19.11.21]

[19] GOV.UK (Mar 2017), 'UK Digital Strategy' [online] available at: Link [19.11.2021]

[20] Ministry of Housing, Communities and Local Government (Jul 2021), 'National Planning Policy Framework' [online] available at: Link [19.11.21]

Agricultural Act (2020)[22]

After leaving the EU, the new Agriculture Act provides the legislative framework for replacement agricultural support schemes. It provides a range of powers to implement new approaches to farm payments and land management. The Act forces farmers to move to more sustainable farming practices. This may increase the potential to provide access to land, enabling greater opportunities for educational centres, trips and training.

Planning for the Future (2020)[22]

The UK Government published a White Paper in August 2020 that contains details on the planning reforms, which promotes sustainability through methods such as tree lined streets, zero carbon ready new homes and 'beautiful buildings'. This White Paper will influence future local planning policy across the UK.

Major projects

Upcoming projects that will increase the demand for green skills in Essex include:

North Falls and Five Estuaries Offshore Wind Farms

Both wind farms are in planning 20km off the South East coast of the UK. The development timeframe has been predicted to be 2020 – 2030[23]. To maintain and operate the North Falls wind farm, it is anticipated that approximately 100 jobs will be created[24]. For the Five Estuaries scheme, when compared to its sister project 'Galloper', around 700 jobs were created during the latter's construction and 60 jobs to operate and maintain[25].

A12 Widening

Proposals are under consultation to widen the A12 between junction 19 and 25 to ease congestion and cope with increased traffic demands. Construction is scheduled for 2024 – 2028[26].

[21] UK Parliament (2020), 'The Agriculture Act 2020' [online] available at Link [10.01.22]

[22] UK Parliament (2020), 'Planning for the Future: planning policy changes in England in 2020 and future reforms' [online] available at Link [10.01.22]

[23] North Falls (2021), 'North Falls: About' [online] available at: Link [19.11.21]

[24] North Falls (2021), 'North Falls: Socio-Economic' [online] available at: Link [19.11.21]

[25] Five Estuaries Offshore Wind Farm (2021), 'Five Estuaries: Benefits' [online] available at: Link [19.11.21]

[26] National Highways (2021), 'A12 Chelmsford to A120 widening scheme' [online] available at: Link [19.11.21]

Lower Thames Crossing

The proposed road crossing the Thames estuary, linking Kent and Essex, is part of the biggest investment in England's road network for a generation and is considered an essential component in the UK's future transport infrastructure. Construction is predicted to be between 2024 and 2030, with 22,000 jobs created during construction[27].

Bradwell B and Sizewell C nuclear projects

The proposed new nuclear power station at Bradwell-on-Sea in Essex[28] is currently paused by the developer but has the potential to be revisited in the future. Sizewell C is a nuclear power station but located in the neighbouring county of Suffolk. Construction is expected between 2025 – 2040, with 3,000 jobs created during construction and 900 for operations[29].

Retrofitting

Retrofitting Essex's 640,000 housing stock, plus other buildings, to meet new standards will require many green skilled jobs such as insulation installers and low carbon engineers.

New Garden Communities

Dunton Hills Garden Village and Harlow and Gilston Garden Town are two key potential garden settlements within Essex. With the former providing 4,000 homes[30], and the latter providing 23,000 new homes[31]. Tendering Colchester Borders Garden Community has also been deemed viable and is under currently undergoing consultation[32].

Freeports

Centred upon the Port of Felixstowe and Harwich International Port, the planned Freeport East will provide Essex with the opportunity to become a hub for global trade and national regeneration, with a focus on innovation. Freeport East has been projected to create 13,500 new jobs and generate a Gross Value Added (GVA) of £5.5 billion over 10 years[32]. The scheme will also establish a 'Hydrogen Hub', which is expected to deliver six parts of the government's 'Ten Point Plan'[34]:

[27] National Highways (2021), 'Lower Thames Crossing' [online] available at: Link [19.11.21]

[28] Bradwell B (2021), 'About the project' [online] available at: Link [19.11.21]

[29] EDF (2021), 'Sizewell C – A new nuclear power station for Britain' [online] available at: Link [19.11.21]

[30] Brentwood Borough Council (2021), 'Dunton Hills Garden Village: Background Information' [online] available at: Link [19.11.21]

[31] Harlow Council (2021), 'Harlow and Gilston Garden Town' [online] available at: Link [19.11.21]

[32] TCB (2021), 'Creating a Place for Life' [online] available at: Link [19.11.21]

[33] Freeport East (2021), 'Our vision for Freeport East' [online] available at: Link [19.11.21]

[34] Freeport East (2022), 'Freeport East Hydrogen Hub' [online] available at: Link [12.01.22]

1. **Hydrogen:** At its peak 1GW of hydrogen could be produced – achieving 20% of the 'Ten Point Plan's' 5GW target.
2. **Nuclear:** Large parts of this hydrogen will be produced via nuclear energy at Sizewell B, and then Sizewell C when this comes online.
3. **Wind:** Hydrogen will also be produced via renewable energy from nearby offshore windfarms, with the extra demand bolstering investment and accelerating progress to the 40GW target.
4. **Greener maritime:** Hydrogen applications will be developed at Felixstowe and Harwich ports to power port equipment and marine vessels.
5. **Zero emission vehicles:** A cluster-based approach to hydrogen supply and demand will allow for a quick rollout of hydrogen buses, trucks, emergency vehicles, trains, construction and agricultural vehicles across the region, in London, and beyond.
6. **Innovation:** The hub will enable at-scale trials of multiple innovative low-carbon initiatives centred around hydrogen and nuclear technologies.

The Thames Freeport is currently much further in its development programme than Freeport East and is now operational. This Freeport economic zone is expected to secure more than 21,000 new direct and indirect jobs on its estate[35], which given its close proximity to south Essex, it is expected that a proportion of these jobs and associated skills training will be taken up by Essex residents.

This Freeport is backed by the Associate of South Essex Local Authorities, Essex Chamber of Commerce, Essex County Council, Opportunity South Essex, Basildon Council, Castle Point Council, Brentwood Council, Rochford Council, Southend Council, Thurrock Business Board, Thurrock Council and the South East LEP[36].

Longfield Solar Farm

Longfield Solar Farm is a proposed new solar energy farm, co-located with battery storage. The project has secured a grid connection agreement which would allow the export of up to 500MW of clean electricity to the National Grid[37].

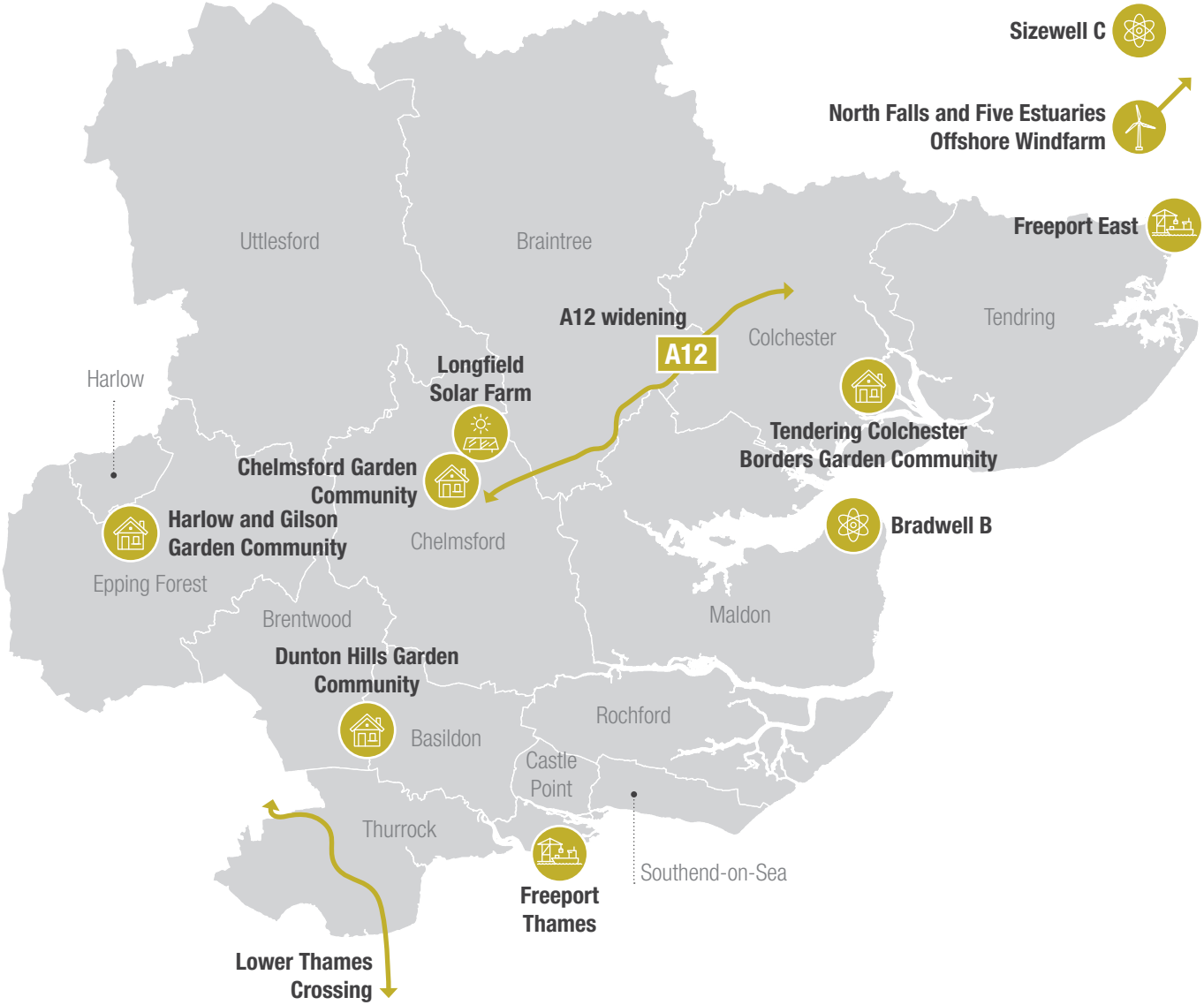
Figure 7 shows the location of the major projects in Essex. The geography of these projects will likely result in demand for green skills in all areas of the county.

[35] Freeport East (2022), 'About' [online] available at: Link [12.01.22]

[36] Thames Freeport (2022), 'Partners' [online] available at: Link [12.01.22]

[37] Longfield Solar Farm (2021), 'What is Longfield Solar Farm?' [online] available at: Link [19.11.21]

Figure 7 Location of major projects in Essex



Other enablers and incentives for green jobs

Demand from industry

The Sector Development Research Study[38], produced for Essex County Council, outlines a demand for a green workforce and skills from businesses. An initial Scoping and Sampling stage identified more than 16,000 businesses in five of the growth sectors in Essex. These include:

- Construction
- Energy
- Life sciences, medtech manufacturing or caretech
- Advanced engineering and manufacturing
- Telecoms and digital technology

The survey revealed that businesses in the growth sectors see 'workforce and skills' (39%) as the number one barrier to growth in the next 5 to 10 years, closely followed by 'COVID-19'. There's clear evidence of the challenge growth sector businesses currently face with recruitment – 62% said their business is 'experiencing, or recently experienced, difficulties finding new recruits with the right skills' – this was consistent across the growth sectors.

After being presented with a short description of green growth, 62% said it 'definitely' or 'might' offer opportunities. The interviews reveal that many companies are aware of the factors, such as legislation and technological advancement, that are pushing green growth and change. However, the extent to which growth sector businesses have been able to find an approach or solution that works for themselves, and their customers varies significantly.

Technological advances

It is likely that the demand for technology and the manufacture of low and zero carbon systems will grow rapidly as the policy drivers referenced above come into force.

Construction in particular is expected to have to keep up and adapt with an influx of ever evolving technologies. These include Building Information Modelling (BIM) technology, robotics, drones, 3D printing, artificial intelligence and machine learning. A workforce equipped with the skillset to utilise these technologies is essential to ensure Essex remains a frontrunner in construction.

A key technological advantage is carbon capture and storage (CCS), the processes of capturing carbon dioxide and storing it for centuries. Historically, the technology has been expensive and slow, but recent developments pave the way for such technology to be implemented on a greater scale. It is important that the workforce is prepared with the skills necessary to install CCS at large carbon-based energy facilities such as cement production and natural gas processing.

[38] QA Research and Ortus Economic Research (Sep 2021), 'Sector Development Research 2021 Final Report'

Consumer demand

The residents of Essex are concerned about climate change according to a Research and Citizen Insight Report[39] recently published by ECC. Two thirds of residents say they are 'extremely' or 'very' concerned about climate change, which is in line with the national population. However, the issue often feels distant and less of a priority than other national and local concerns. Most Essex residents acknowledge that their actions impact on climate change, but many expect Government and business to take the lead.

Consumer demand is forecast to rapidly increase as policy interventions lead to low carbon technologies and solutions becoming mainstream, for example electric vehicles, re-insulating properties, domestic solar panels, replacing gas boilers with heap pumps and other low carbon technologies.

Essex Climate Action Commission

The Commission[40] was set up to advise Essex County Council about tackling climate change. It has over 30 members and ran for an initial two years, with an extension now announced till 2025. The aims set out by The Essex Climate Action Commission include identifying ways to mitigate the effects of climate change, improve air quality, reduce waste across Essex and increase the amount of green infrastructure and biodiversity in the county, as well as explore how they can attract investment in natural capital and low carbon growth.

Everyone's Essex

Everyone's Essex sets out the county's 20 commitments for the next four years (2021 – 2025). Throughout the strategy there is a common green theme, with a focus on green growth, green communities, net zero and levelling up.

Green finance and investment

The growth of sustainable finance, including the increasing array of financial products, has attracted the attention of investors, policy makers, and various stakeholders in civil society as to its potential to deliver financial returns, align with societal values, and contribute to sustainability and Net Zero. In particular, Environmental Social Governance (ESG) investing has become a leading form of sustainable finance and has shifted from early stages of development and is now considered mainstream finance[41].

[39] Essex County Council (Jul 2021), 'Research to explore resident attitudes towards climate action in Essex', BritainThinks and Essex County Council Research and Citizen Insight Team [online] available at: Link [19.11.21]

[40] Essex County Council (2021), 'Essex Climate Action Commission' [online] available at: Link [19.11.21]

[41] OECD (2021), 'ESG Investing and Climate Transition: Market Practices, Issues and Policy Considerations' [online] available at: Link [19.11.21]

4.3 Impact of drivers on future demand

Section 4.1 demonstrates that historic trends suggest a baseline growth in green jobs of 2,933 jobs in 2019 to 5,761 jobs in 2030, a rise of 2,818 (96%). As detailed in Section 4.2, there are numerous existing and emerging policies, projects and other enables and incentives for green skills that will likely stretch demand beyond this baseline level.

The Government's 'Ten Point Plan' (referenced in Section 4.2) includes a prediction of the number of UK green skilled jobs by 2030 (Table 4) that will result from the UK transition towards net zero. These figures have been used to model the potential impact that the drivers will have on the future demand for green jobs in Essex.

Table 4 shows that if Essex were to retain its current proportion of UK jobs predicted in these industries (based on current distributions), then demand for green skills in 2030 would rise from the baseline of 5,761 to 13,905, a rise of 8,155 - over 242%.

Table 4 Predicted growth in green skilled jobs outlined in The Ten Point Plan

Industry	2030 UK Jobs	2030 Essex Jobs
Offshore wind	60,000	896
Hydrogen	8,000	119
Nuclear	10,000	149
Zero emission vehicles	40,000	597
Public transport	3,000	45
Aviation and green ships	5,200	78
Green buildings	50,000	746
Carbon capture and storage	50,000	746
Flood defence	20,000	299
Green finance	300,000	4,479
Total UK	**546,200**	**8,155**

Furthermore, the recently published 'Net Zero Strategy: Build Back Greener'[42] outlines UK government's ambition to reach two million green jobs by 2030. If Essex were to retain its fair share of the government's ambition of two million green skilled jobs by 2030, the number in Essex would rise to 44,959.

[42] HM Government (Oct 2021), 'Net Zero Strategy: Build Back Greener' [online] available at: Link [19.10.21]

These two scenarios are plotted alongside the baseline in Figure 8 below.

Figure 8 Predicted growth in green skilled jobs in Essex

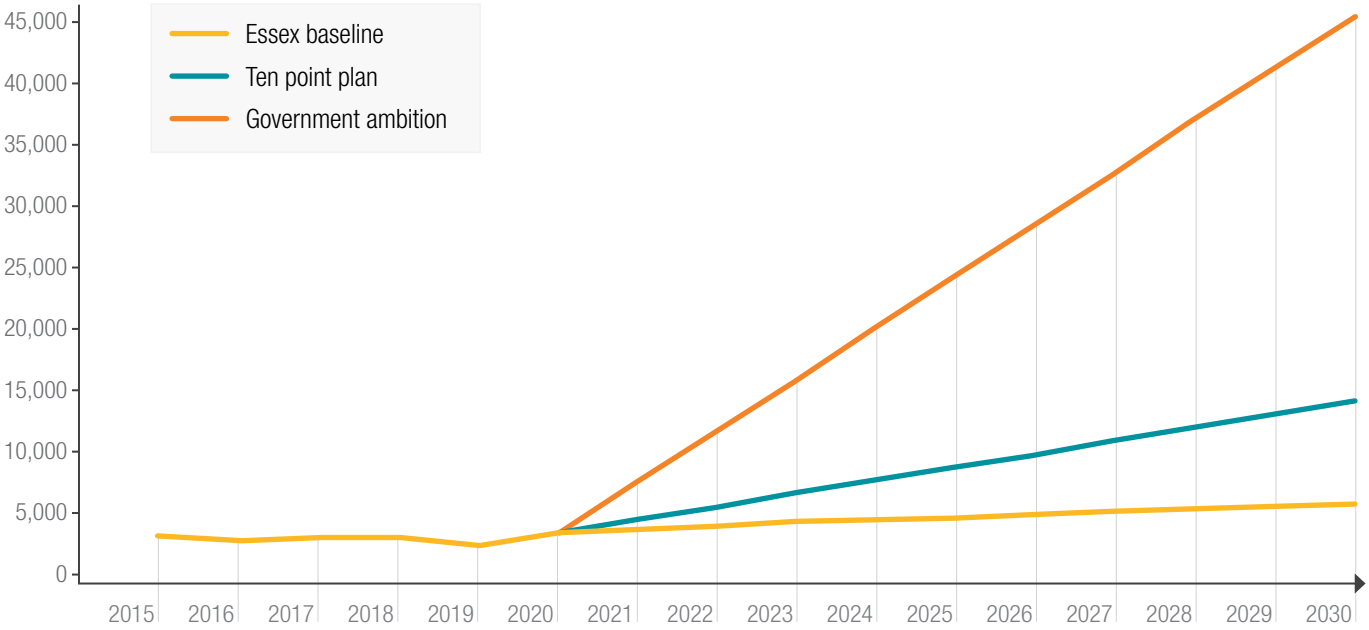


Table 5 shows the split of predicted jobs by industry. This distribution is based on the estimated current level of green skilled jobs in Essex combined with the identified areas of industry growth outlined in the government's Ten Point Plan. The data assumes that Essex broadly retains its current proportions of jobs in these industries as they grow.

At this time, it is difficult to assess industries that may grow more or less rapidly in Essex based on geographic or political drivers such as the availability of natural resources or incentives / funding opportunities that are more local to Essex.

The data demonstrates the opportunity for 'Direct Green' Jobs (as outlined in Section 3.2) and does not include the likely growth 'Enabling Green' jobs.

Table 5 Predicted green skilled jobs in Essex by industry

Low Carbon and Renewable Energy Economy (LCREE) Data Scaled to Essex		2030 Scenarios Scaled to Essex		
Industry	**2019 LCREE**	**Baseline**	**Ten point plan**	**Govt. Ambition**
Alternative fuels	7	29	148	480
Bioenergy	95	225	225	728
Carbon capture and storage	2	5	751	2,428
Energy efficient lighting	481	599	599	1,936
Energy monitoring, saving or control systems	166	351	650	2,100
Fuel cells and energy storage	14	12	57	184
Hydropower	9	25	25	81
Low carbon financial and advisory services	74	164	4,643	15,011
Low emission vehicles and infrastructure	242	335	1,010	3,265
Nuclear	174	369	518	1,675
Offshore wind	102	273	1,169	3,779
Onshore wind	52	75	75	243
Other energy efficient products	1,328	2,804	3,551	11,481
Other renewable electricity	5	20	20	66
Renewable combined heat and power	8	12	12	38
Renewable heat	65	146	146	472
Solar photovoltaic	111	306	306	991
Essex Total	**2,933**	**5,751**	**13,905**	**44,959**

4.4 Geography

The map overleaf shows:

- The distribution of population in Essex
- The location of major projects
- Locations of FE and HE institutions

The major projects are located across the county:

- North East – Freeport East, adjacent Sizewell C Nuclear, Tendring Colchester Borders Garden Community and North Falls and Five Estuaries Offshore Windfarms
- Central / East – A12 Widening, Bradwell B Nuclear and Longfield Solar Farm
- South – Lower Thames Crossing, Freeport Thames, Dunton Hills Garden Community
- West – Harlow and Gilston Garden Community

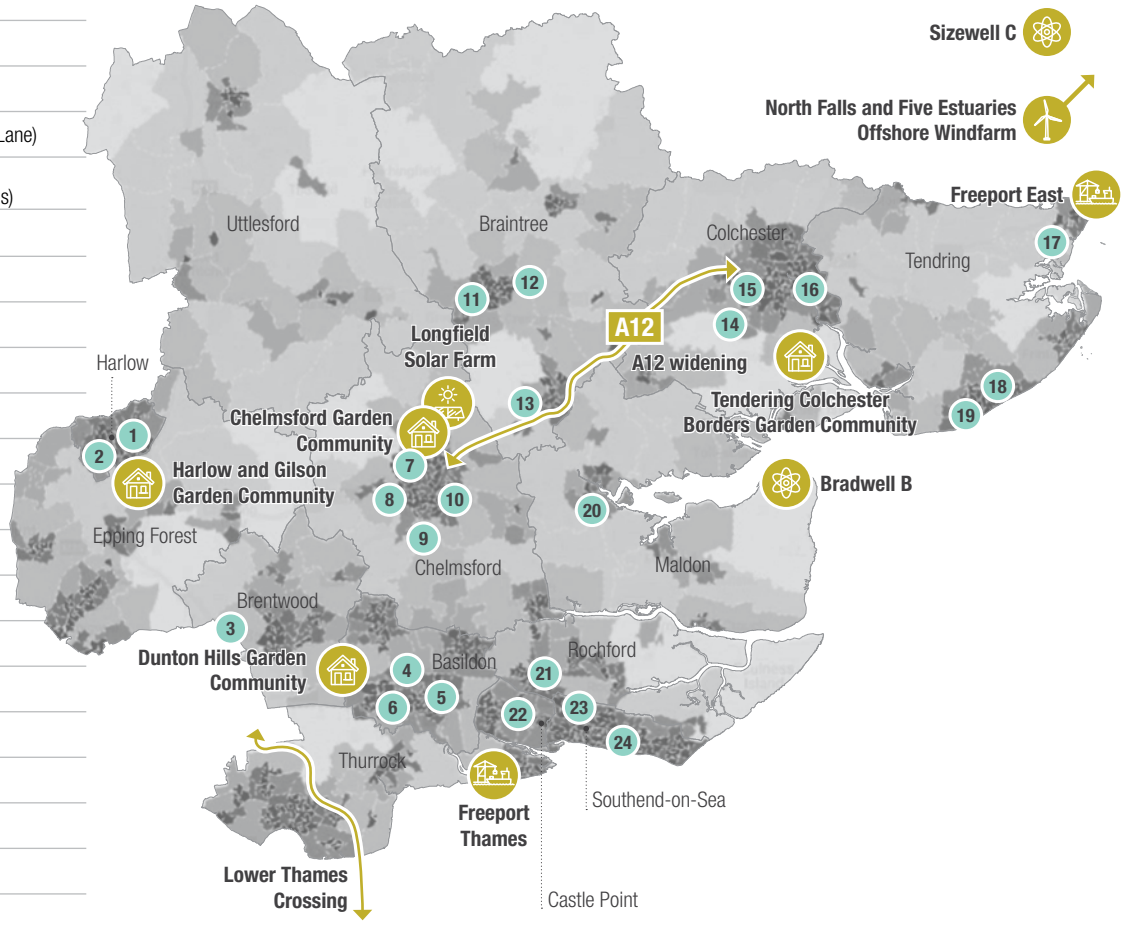
The geography of these projects will likely result in demand for green skills in all areas of the county.

The distribution of FE and HE institutions largely follows population density and is balanced to serve the needs of all areas of Essex

Figure 9 Location of major projects and educational institutions in Essex

Educational institutions

1. Harlow College
2. ACL Harlow
3. ACL Brentwood
4. South Essex College (Luckyn Lane)
5. South Essex College (Centre for Digital Technologies)
6. ACL Basildon
7. ACL Chelmsford
8. Writtle University College
9. Chelmsford College
10. Anglia Ruskin University
11. STEM Centre
12. Colchester Institute Braintree
13. ACL Witham
14. Colchester Institute
15. ACL Colchester
16. University of Essex
17. Harwich Energy Skills Centre
18. Colchester Institute Clacton
19. ACL Clacton
20. ACL Maldon
21. ACL Rayleigh
22. USP College
23. South Essex College (Stephenson Road)
24. South Essex College (Southend Campus)



5 PROVISION OF UPSKILLING

5.1 Further Education

Further Education courses

A review has been carried out of the higher and Further Education providers and the courses that they currently offer which may contribute to enhancing green skills in Essex. These courses are listed in Table 6.

Table 6 Further Education courses on offer in Essex that are relevant to green skills

Name	Level of qualification	Courses on offer
ACL Essex	Courses	English, Maths, Science and Digital
Chelmsford College	Apprenticeships	Carpentry and Joinery (sustainability of timber) Electrical Installation Engineering Operative Engineering Fitter Digital Support Technician
	Courses	Electrical Installation Construction / Built Environment Engineering (multiple) IT / Digital
Colchester Institute	Apprenticeships	Autocare Technician (hybrid/electric covered) Carpentry Groundworker Manufacturing engineering Motor vehicle service Network engineer Domestic heating technician (heat pumps/ PV / biomass boilers / water recycling systems)
	Courses	Advanced Technical Engineering Computing Construction and Built Environment Electronics (multiple) Vehicle Maintenance and Repair (includes EVs)

Name	Level of qualification	Courses on offer
Colchester Institute	Undergraduate	Construction Management – QS, site management MA Education – 'update skills of existing teachers and educators'
Harlow College	T levels	Building Services Engineering Design, Surveying, Planning for Construction Digital Support and Services Science
	Apprenticeship	Construction – Brickwork, Carpentry, Electrical Maintenance
		Engineering/Manufacturing – Autocare Technician, Engineering Technician
	Other	General Engineering Higher National Certificate and Diploma
	Part-time / Adult courses	Building Services (plumbing) Level 2 NVQ Diploma in Plumbing and Heating APL Site carpentry Diploma (EWPA) Multiple teaching qualifications
South Essex College Colchester Institute	T levels	On site construction (sustainability module)
	GCSE / A Level	Motor Vehicle Maintenance and repair (covers EVs) Plethora of engineering and construction BTECs / A Levels etc
	Apprenticeship	Plumbing and Domestic Heating Technician (covers environmental and energy efficient working practices) Engineering (Mechatronics pathway) Electrical Installation
USP College	N/A	No specific BTECs / Apprenticeships to mention that have relevance to green skills (apart from biology, physics A Levels)

Sources: Harlow College, South Essex College, Colchester Institute, Chelmsford College, USP College, ACL Essex

Many of the courses shown above overlap with the industries and sectors that are linked the green skills.

Stakeholder feedback also highlighted the importance of ensuring all course curriculums are reviewed to identify where sustainability and green skills could be enhanced within the teaching, to ensure all students are taught a level of 'sustainability literacy' within their area of interest.

Apprenticeships

The Institute for Apprenticeships and Technical Education (IfATE)'s Sustainability Framework[43] helps employer trailblazer groups, who are responsible for developing apprenticeship standards and identify how different occupations can achieve sustainability goals, with a particular focus on net-zero carbon.

To meet the government's decarbonisation plans, specialist expertise in roles such as renewable energy systems, batteries etc. will be required. However, the IfATE state that 'all occupations now have a direct or indirect impact on sustainability', therefore all jobs should be green jobs. With this in mind, the IfATE's Sustainability Framework uses a 'shades of green' spectrum to identify that all apprenticeships are affected by the sustainability agenda in range of ways.

In addition to the framework, IfATE has established a green apprenticeship advisory panel that will help ensure the portfolio of occupation standards reflects the roles need to achieve sustainability goals[44].

Further Education enrolments and achievements

The government provides statistics about the number of enrolments and achievements each academic year:

- Enrolments are the numbers of places taken on classroom-based education and training courses as well as apprenticeships, traineeships and community learning
- Achievements are the number of completed courses

Please note that as an individual can enrol and complete more than one course per year these cannot be equated to individuals that have been upskilled.

The UK wide enrolment data has been analysed to calculate the enrolments and achievements in Essex. Data is currently unavailable for where Essex residents may be studying outside of Essex. However, it is important to recognise the significance of providers in neighbouring areas e.g. South Norfolk, North London and other neighbouring travel to learn areas.

Table 7 shows the total number of Further Education enrolments and achievements by residents in Essex for August 2020 to April 2021. This is the latest data available and it is noted that the proportion of achievements will increase once the full academic year of data is published.

[43] Institute for Apprenticeships and Technical Education (Unknown), 'Sustainability Framework – A guide for trailblazer groups and route panels' [online] available at: Link [11.01.22]

[44] Institute for Apprenticeships and Technical Education (2022), 'Green apprenticeships advisory panel' [online] available at: Link [11.01.21]

Table 7 2020/21 (Aug to Apr) Further Education enrolments and achievements by subject (classroom-based learning and training)

Subject	Enrolments	Achievements	Starts	Achievements
Agriculture, Horticulture and Animal Care	2,180	120	810	280
Arts, Media and Publishing	3,830	420	220	-
Business, Administration and Law	22,700	10,240	21,760	8,580
Construction, Planning and the Built Environment	7,640	2,490	3,690	1,050
Education and Training	4,730	1,520	770	300
Engineering and Manufacturing Technologies	4,460	740	5,540	2,320
Health, Public Services and Care	48,130	19,030	16,640	6,430
History, Philosophy and Theology	1,260	1,220	-	-
Information and Communication Technology	9,760	3,960	2,610	1,470
Languages, Literature and Culture	3,800	80	430	110
Leisure, Travel and Tourism	3,860	360	6,100	2,280
Not Applicable/ Not Known	1,160	-	-	-
Preparation for Life and Work	86,280	26,420	-	-
Retail and Commercial Enterprise	15,590	8,020	58,570	22,820
Science and Mathematics	5,550	200	810	280
Social Sciences	860	160	220	-
Essex Total	221,790	74,980	21,760	8,580

Source: Department for Education Further Education and skills statistics 22 July 2021

Further analysis has been undertaken to identify the subjects that are most aligned to green skills. These have been identified as:

- Agriculture, Horticulture and Animal Care
- Construction, Planning and the Built Environment
- Education and Training
- Engineering and Manufacturing Technologies
- Information and Communication Technology
- Science and Mathematics

Table 8 2020/21 (Aug to Apr) Further Education enrolments and achievements for residents in each district on Essex in subjects linked to green skills

	Classroom-based learning and training		Apprenticeships and traineeships	
District	**Enrolments**	**Achievements**	**Starts**	**Achievements**
Basildon	2,790	610	1,530	550
Braintree	2,750	770	1,190	580
Brentwood	1,070	270	560	230
Castle Point	1,030	160	830	260
Chelmsford	2,890	790	1,420	480
Colchester	4,350	1,000	1,340	660
Epping Forest	2,760	720	960	300
Harlow	2,590	690	470	320
Maldon	870	260	680	210
Rochford	1,010	160	700	290
Southend on Sea	3,720	1,480	940	370
Tendring	3,640	970	890	480
Thurrock	3,840	1,010	1,380	490
Uttlesford	1,010	140	530	200
Essex Total	**34,320**	**9,030**	**13,420**	**5,420**

Source: Department for Education Further Education and skills statistics 22 July 2021

5.2 Higher Education

Higher Education courses

The same analysis has been undertaken for Higher Education (please see section 5.1 for the full methodology).

Table 9 Higher Education courses on offer in Essex that are relevant to green skills

Name	Level of Qualification	Courses on offer
Anglia Ruskin University	Apprenticeships	Agri-Food Technology Electronics and Renewable Energy Systems Electronics and Robotics Construction / Civil / Electronic engineering Environmental Management Building Surveying
	Postgraduate/ PhD / MPhil	Sustainability Town Planning
Harlow College	Higher National Certificate/Diploma (HNC/D) (Level 4/Level 5)	Engineering International Travel and Tourism Management
University Centre Colchester	Undergraduate	Construction Management (Architectural Technology) (BSc) Construction Management (Quantity Surveying) (BSc) Construction Management (Site Management) (BSc) Engineering (BEng)
	Higher National Certificate/Diploma (HNC/D) (Level 4/Level 5)	Engineering (Electrical and Electrical) Engineering (Mechanical Engineering)
	Degree Apprenticeship (Level 6)	Manufacturing Engineering
University Centre (South Essex College)	Undergraduate	Sustainability and Global Citizenship (BSc)
	Higher National Certificate	General Engineering (HNC)

Name	Level of Qualification	Courses on offer
University of Essex	Degree and Postgraduate	MA Environment, Society and Culture Biological, biochemistry, biomedical and marine biology sciences Computer science and data analytics Computer, electronics, mechatronics and robotics engineering PhD / MPhil Environmental Sciences / Biology
Writtle University College	Apprenticeship	Arborist Horticulture, Greenkeeping and Sports Turf Apprenticeships
	College	Agriculture Land and Wildlife Management (Countryside Conservation) Horticulture / Plant Growth
	Degree and Postgraduate	Agriculture (Regenerative Systems) Sustainable Food Production (Fresh Produce) Horticulture, Postharvest Technology Crop production

Sources: Anglia Ruskin University, Harlow College, University Centre Colchester, South Essex College, University of Essex, Writtle University College

Higher Education annual intake of undergraduates and postgraduates

The government provides statistics, through the Higher Education Statistics Agency (HESA), of annual intake of undergraduates and postgraduates. The three Higher Education providers located in Essex are: The University of Essex, Anglia Ruskin and Writtle University College.

Table 10 shows the uptake of both undergraduate and postgraduate courses by subject area for the 19/20 academic year for the three universities in Essex. HESA does not provide data from previous years, making it difficult to see whether the uptake in subject areas across the three universities has changed. However, the data provider did illustrate of the 35,975 Higher Education students where Essex is their domicile, 34,815 attend university in England, 570 in Wales, 520 in Scotland and 70 in Northern Ireland.

With approximately 44,000 students across Essex's three university providers, they make up 2.4% of Essex's 1.842 million strong population.

Table 10 2019/20 Higher Education providers in Essex by subject (undergraduate and postgraduate)

Subject Area	The University of Essex	Anglia Ruskin	Writtle University College
Agriculture, Horticulture and Animal Care	2,180	120	810
Arts, Media and Publishing	3,830	420	220
Business, Administration and Law	22,700	10,240	21,760
Construction, Planning and the Built Environment	7,640	2,490	3,690
Education and Training	4,730	1,520	770
Engineering and Manufacturing Technologies	4,460	740	5,540
Health, Public Services and Care	48,130	19,030	16,640
History, Philosophy and Theology	1,260	1,220	-
Information and Communication Technology	9,760	3,960	2,610
Languages, Literature and Culture	3,800	80	430
Leisure, Travel and Tourism	3,860	360	6,100

Subject Area	The University of Essex	Anglia Ruskin	Writtle University College
Not Applicable/ Not Known	1,160	-	-
Preparation for Life and Work	86,280	26,420	-
Retail and Commercial Enterprise	15,590	8,020	58,570
Science and Mathematics	5,550	200	810
Social Sciences	860	160	220
Essex Total	221,790	74,980	21,760

Source: What do HE students study? | HESA

5.3 Employers and industry led upskilling

Employer led training programmes

Employer led training programmes give students a hands-on approach to learning and skills application. They are also a highly affordable way for individuals to gain new skills without paying for courses or university degrees.

Desktop research reveals that it is difficult to find data on current capacity and delivery of in-house employer led training programmes within Essex County.

Community learning and adult learning initiatives

With nine main community learning centres across the county and hundreds of courses on offer, ACL is the largest provider of adult education in Essex and the main apprenticeship provider for Essex County Council. The service currently has 313 apprentices on programmes including health and social care, business administration and leadership and management. The largest learning cohorts are undertaking courses in maths, English (including ESOL), supported learning and creative subjects. ACL is Essex's key provider of community learning and adult learning initiatives. The subjects offered support the adults of Essex to improve their skills, retrain and improve their health and wellbeing.

Industry providers and professional membership bodies

Table 11 below details the courses that are currently on offer from skills providers in Essex. Most of the providers have a construction focus, specifically plumbing, gas and electrical. It is difficult to identify whether green skills are embedded within the courses, with many providers not offering such detail.

Table 11 Current delivery of courses from Essex's industry providers

Name	Sector	Courses on offer
Essex Skills Centre (Colchester)	Plumbing	Introduction to Plumbing Installation and Maintenance Plumbing Course City & Guilds NVQ Level 2 Plumbing and Heating WRAS Water Regulations Course Unvented Hot Water (G3) Plumbing training course Legionella Prevention
	Electrical	18th Edition Course – 2382-18 (BS 7671:2018) 18th Edition Electrical Update Course
	Gas	Initial Gas Assessment Gas reassessment course CCN1 Core Stand Alone gas training course Managed Learning Programme for new entrants to gas and experienced Commercial to Domestic Changeover Course Boilers, cookers and fires reassessment course Energy Efficiency LPG Changeover training course
STC Group (Romford)	Plumbing	Customer service, business administrator, credit controller
	Electrical	Warehouse operative, freight, large goods vehicle
	Multiskills – painting decorating, bricklaying, floor and wall tiling	Technician, cabin crew, operations manager, operative
Seetec Outsource	Gas	Impact Moling, Welding, Profuse Peelable Pipe Training, Confined Spaces, Network Construction Operations,
	Streetworks	Highways Maintenance, NRSWA Monitoring, Signing, Lighting
	Heath, Safety and Environment	EUSR Accredited (Water and Gas), Site Supervision Safety Training Scheme, Manual Handling, Confined Spaces

Name	Sector	Courses on offer
Seetec Outsource	Water	Impact moling, repair and maintenance, servicelaying, mainlaying
	CPCS and NPORS Plant	EUSR Accreditation - water and trench support / deep excavation
	NVQs	Dump truck, tower crane, slinger, telehandler, excavator, telescopic handler, marshaller, Construction Site Management, Plant Operations, Construction Contracting Operations Management, Network Construction,
MPower Training (Waltham Abbey)	Plumbing	Level 2 Diploma in Plumbing Studies Level 2 NVQ in Domestic Plumbing and Heating Water Regulations Course
	Gas	Level 3 Diploma in Gas Utilisation Apprenticeships Gas ACS Training and Assessment
	Construction	NVQ Level 2: Painting and Decorating, Site Carpentry, Dry Lining Finishing/Fixing, Property Maintenance Operative Apprenticeship NVQ Level 2 and 3: Fenestration Installation NVQ Level 3: Occupational Work Supervision
The Eastern Training Alliance (Halstead)	Plant and Machinery	180/360 Degree Excavator, All Terrain Vehicles, Forklift, Tractor Welding, Brushcutter, Chainsaws, Ploughing
	Agronomy and Arboriculture	Chainsaw felling and maintenance, hedge laying, mower, woodchipper Pesticides, pest control
	Health and Safety	Asbestos awareness, construction safety, electrical safety, first aid, farm safety, hygiene, manual handling
Farming UK	Agriculture	Promotes courses offered by universities such as Hartpury, Harper Adams, Royal Agricultural University, Writtle College and more.

Source: Individual organisation websites

Careers opportunities guidance

The 'Greta Affect' has seen a huge surge in young people wanting to 'save the world', yet few associate green skills with this. It has been predicted that 75% of all jobs[45] over the next 10 years will require STEM skills, so it is crucial that young people are considering this when choosing subjects and planning for life after education. However, feedback from the stakeholders has been that current provision is limited, and many are not exposed as to what STEM jobs are available.

Universities and colleges are also well equipped to provide careers opportunities guidance. For instance, The University of Essex has a Careers Hub, as well as their own careers advisors for their students. Typically, perspective students are unable to access these services before enrolling on a course.

Adults who are not associated with any education institutions are able to access the National Careers Service[46] which provides career information, advice and guidance to inform decisions on learning, training and work to everyone across England, at all stages of their career. The National Careers Service 'job categories' section does not identify jobs which have green skills.

Greater focus should also be given to employer engagement in schools as it exposes young people to the career opportunities and a different perspective. A 2014 report, undertaken by the Education Development Trust, highlights how employer engagement recognises that it is not a 'one size fits all', and enhances attainment through improved motivation instead. The data from the survey illustrates that approaches which combine hands-on learning experiences, careers exploration, and first-hand experience are likely to optimise outcomes[47].

Essex County Council has launched an online platform - Essex Opportunities Portal[48] - which lists resources, guidance, career opportunities, and Q&A style pages with careers options. There are also separate tabs with a focus on redundant individuals, school leavers and information for employers. However, a common theme seen with platforms such as these is a lack of green skills/job focus. Many of the jobs listed under 'engineering' for instance, have a sustainability focus and could therefore also be grouped under the 'environment and land' job section.

[45] Directions (2021), 'STEM Learning' [online] available at: Link [19.11.21]

[46] GOV.UK (2021, 'National Careers Service' [online] available at: Link [25.11.21]

[47] Mann, A., and Dawkins, J, 'Employer engagement in education', CfBT Education Trust [online] available at: Link [19.11.21]

[48] Essex Opportunities (2021), 'Information on employment and training' [online] available at: Link [19.11.21]

5.4 Capacity to meet the future demand for green skills

Section 4.3 outlines three scenarios of future demand (2030) for green skills in Essex:

Baseline: 5,761 new jobs

Ten Point Plan: 13,905 new jobs

Government Ambition: 44,959 new jobs

The provision of education and upskilling opportunities has been outlined in Section 5:

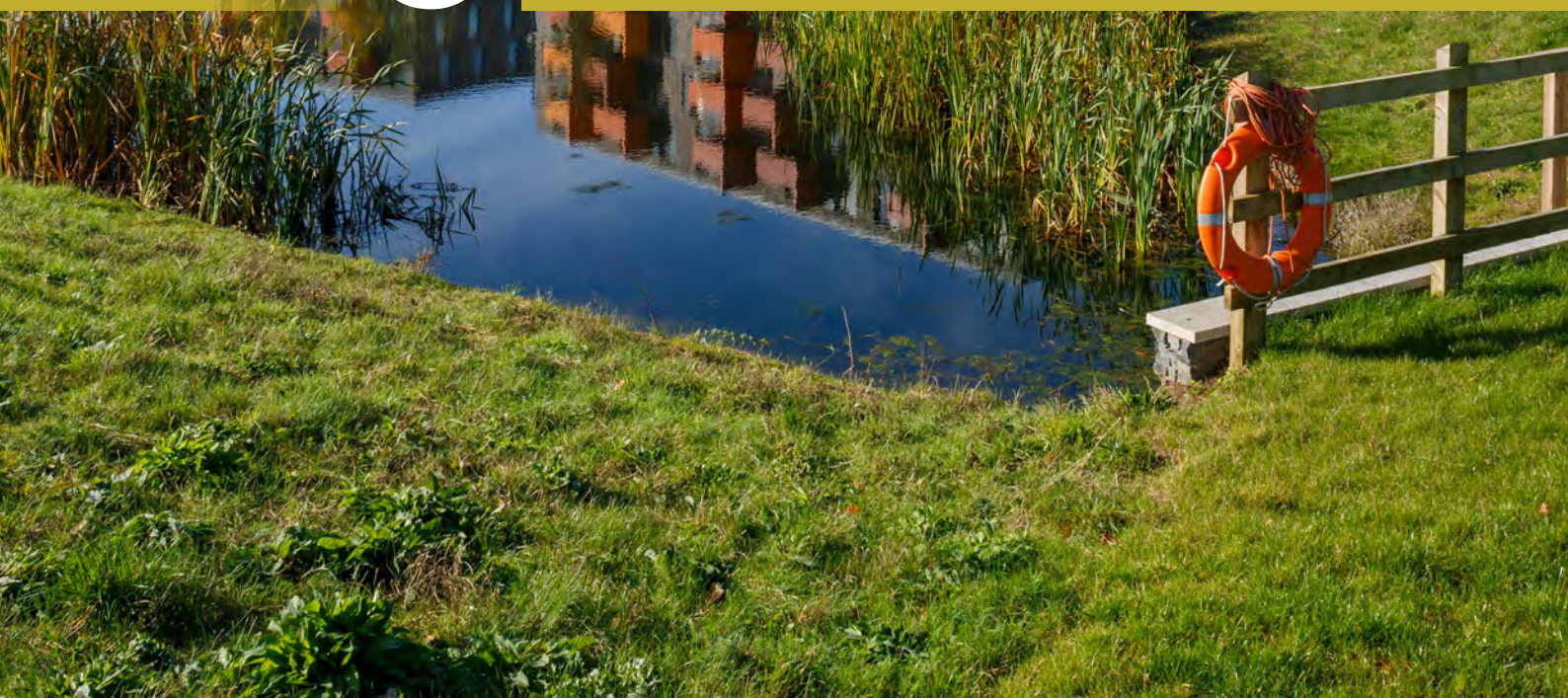
- Further Education data, including classroom and apprenticeship training where the student's home postcode is in Essex, shows 47,740 enrolments in 2020/21 in subject areas relevant to green skills. These statistics will include a small proportion of individuals that are attending institutions outside of Essex, however, it is also true that some students that reside outside the county will be enrolled at Essex institutions but not included in the data.
- Higher Education data shows 44,015 undergraduate and postgraduate places taken up in the three Essex universities in 2019/20 (latest data available).
- Adult Community Learning (ACL) Essex had 12,991 active learners in 2017.

Combined, the above opportunities equate to over 100,000 learning places available in Essex each year with further employer and industry led upskilling opportunities also available. This shows that, in theory, there is good capacity of classroom and apprenticeship enrolment opportunities to service the predicted growth, however this is dependent on the learning opportunities being aligned to green skills needs. It is therefore essential that those responsible for providing education and upskilling opportunities rapidly understand the emerging needs around green skills in order to direct courses and curriculum towards the right areas.

Stakeholder feedback demonstrated that there is little structured evidence of demand, making it difficult for education and upskilling providers to respond appropriately. Feedback suggests that that demand is not fully understood or communicated well and is also not a top priority as businesses recover from the COVID-19 pandemic.

It is anticipated that the demand in green skills may not become fully evident until legislation and national policy is translated to the local level to be implemented, which will force the industry and consumers to react quickly. Key examples of this in practice include the phasing out of petrol and diesel vehicles and the ban on fitting new gas boilers set to be included in the forthcoming Future Homes Standard.

6 GAPS, CHALLENGES AND BEST PRACTICE



6.1 Identified gaps and challenges

Policy

It is important that national policy is implemented and enforced in the local context. This requires national policy to be translated at the local level, including into local planning policy. To enable this to happen there needs to be technical expertise to develop these local policies based on national guidance and then to implement them. There also needs to be more technical expertise to enforce and monitor local policies. Professionals, such as planners and building surveyors, have a strong role to play in ensuring policy is implemented on the ground, for example in developing 'green' developments.

Data

There is currently a limited availability of data for both supply and demand. This restricts the detailed assessment of the local demand for green skills and the supply of training and upskilling provision. Gaps in both future supply and demand data make it challenging to evidence gaps and motivate positive action. A lack of accessible data has been observed in the following areas:

- Current green skilled jobs within Essex
- Current training and education courses that support green upskilling, particularly where the 'green' component isn't the full function of the course
- Current capacity of training courses (enrolments and achievements are known but not presented alongside course capacities) i.e. we do not know if courses are full
- Future demand for green skills
- Planned future provision of education and training

Awareness

To create a balance in supply and demand for green skills provision, it is essential that information and understanding is consistent amongst stakeholders:

- Businesses and individuals understand the opportunity that green skills present for them, for some aspects this is consumer led demand
- The demand for green skills is understood by education and training providers and they are aware of the pipeline of projects and legislation training
- The availability of upskilling opportunities is understood by businesses and individuals that wish to upskill

Education

Shortage of teaching staff

Shortages of teaching staff with the right skills, experience and interest in delivering green skills has been a common theme throughout the engagement sessions. Teaching salaries mostly do not compete with the private opportunities that are currently available, which deter many experienced professions from teaching positions. One Essex College reported that they need 20 construction teachers alone.

Teachers may also be out of touch with the industries and must be fully engaged with green skills conversations.

Lack of carbon literacy

A lack of carbon literacy across the general (and Essex) population was a key disruptor identified across our stakeholder engagement sessions. Jobs that contribute to low carbon and sustainability are not necessarily labelled as green, but this does not make them any less important in supporting the transition to net zero. Awareness of how jobs contribute to the climate emergency is crucial, especially to motivate younger generations.

Furthermore, as the decarbonisation and green agenda continues to gain momentum it will become more 'normalised' and embedded across the socio-economic landscape; environmental literacy will need to be similarly embedded into education and across the Essex population.

Disconnection with industry and business needs

Stakeholders have identified the need for educators to be aware of the pipeline of projects and policy changes so they can update their course offerings with more certainty.

Communication

There is an ambition to decarbonise the UK economy at pace and this is seen as essential in our collective response to the climate emergency. To achieve this, rapid upskilling is needed across a range of sectors. However, there are several communication constraints that can limit the pace of upskilling:

- Provision of upskilling resources requires allocation of funding and time for preparation, marketing and enrolment of courses. Training and education providers will be naturally conservative, waiting for strong evidence of demand to gain confidence any new offerings will be subscribed. Better communication can help demonstrate confidence in demand.
- Most businesses naturally lean towards servicing existing demand, with few in a position to speculatively upskill in anticipation of future revenue opportunities. Again, better communication of demand and upskilling opportunities may encourage more rapid change.
- The vast majority of the existing workforce require a consistent income and will consider immediate availability of opportunities when making career choices.

At present there are insufficient communication channels available to enable all relevant stakeholders to remain informed.

Resources

Covid-19 pandemic

A key disruptor in the Essex green skills agenda is the ongoing Covid-19 pandemic. SMEs are focussing on stability after the pandemic disruption and are not focused on the medium-term opportunities that enhancing their green skills and service offer will provide.

Cost

A further common theme identified throughout the stakeholder engagement sessions is the cost involved in upskilling, and the lack of funding opportunities for green measures, which would in turn drive the demand for green skills.

A recent example is the 'Green Homes Grant' which the government scrapped just six months following its release on 28 August 2020[49]. The grant scheme was developed to help people install energy efficiency measures in their homes[50]. However, of the targeted 600,000 properties expected to benefit from the scheme, only 15,182 households on low income installed home insulation measures[51]. Claimants of the scheme reported issues finding accredited installers who were willing or able to complete the works, whilst builders complained of "excessive red tape" in registering for the scheme, and that heat pump installations in particular have been hindered by the terms.

Stakeholders have posed the query as to whether this may have made people wary of applying for funding. It is important that businesses, particularly SMEs, understand and make the business case for upskilling or greening their operations. Making money will be the ultimate drive for businesses to adapt and respond to the climate agenda.

[49] Fiona Harvey (Mar 2021), 'UK government scraps green homes grant after six months', The Guardian [online] available at: Link [19.11.21]

[50] GOV.UK (Jul 2021), 'Green Homes Grant voucher release August 2021', Department for Business, Energy and Industrial Strategy [online] available at: Link [19.11.21]

[51] Miles Brignall (Nov 2021), 'Green homes grant scheme helped just 15,000 low-income households buy insulation' The Guardian [online] available at: Link [19.11.21]

Careers advice

A lack of coherent, structured careers advice in schools remains a challenge. This has been accentuated by a withdrawal of funding from schools relating to careers information advice. As such, the quantity and quality of advice varies from school to school.

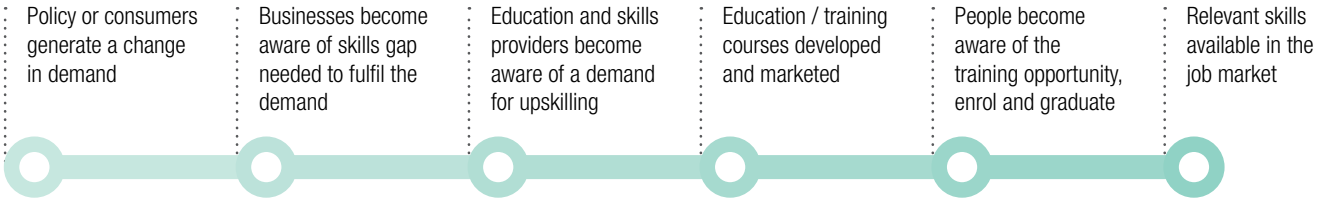
A 2019 report[52] which came out of the National Careers Summit in London, highlights that around a fifth of secondary schools receive less than £2,000 in funding per annum, equating to approximately £2 of careers spending per student. With the report stating that only 10% of secondary schools receiving adequate funding, it is evident that greater careers provision is needed.

Sufficiently funded, comprehensive careers advice is critical to enhance students understanding of green skilled jobs. On many occasions, such jobs are not explicitly labelled as 'green' and so environmentally aware young people, who want to make a difference, struggle to direct their interests at the right jobs. It is important that primary school aged children are not excluded from careers education since some students have made the decision on what career they want by the time they leave primary school.

[52] Careers England (Nov 2019), 'Nine out of ten schools have insufficient funding for careers advice' [online] available at: Link [19.11.21]

6.2 Summary of challenges raised by stakeholders

- In some areas we are still waiting for firm policy e.g. future homes
- The Education and Skills system is reactive and generally requires funding to develop
- Consumer led demand is powerful but has, to date, been slow to emerge
- Hard for school leavers to identify and understand the opportunities related to green skills
- Hard for businesses to identify upskilling opportunities
- Hard for upskilling providers to understand business needs and demand
- Hard for employees to understand alternative 'green' work opportunities
- As SME's recover from the COVID-19 pandemic they are more likely to be focused on immediate revenue generating work, rather than horizon scanning and upskilling for potential future opportunities
- When engagement and groups are setup, it is usually only large businesses that can afford resources to attend, therefore, it is impossible to get representative views from smaller businesses
- There are many links in the chain and information flow can be slow between the 3 key stakeholders (business, education and skill providers, potential workers):



- It can be challenging to act as 'one Essex' across the various Boroughs and Districts with relatively dispersed people, businesses and infrastructure
- The earning potential providing green skills in industry outstrips the earning potential to deliver green skills training or education
- Re-training will be an important to help fulfil demand, but needs to be incentivised
- There remains an image problem with vocational training
- Apprenticeships can be slow to create / update and misaligned to skills needs
- Industry and training providers need to work together to demonstrate opportunities available to people

6.3 Best practice

This section details existing examples of best practice in Essex, as well as other examples of best practice which Essex can take influence from for implementation into other schemes. For example, Essex can utilise some of its existing green industries and ensure schools in the local areas are engaged with them, this will replicate the successes as seen with Nissan in Sunderland.

LGA mapping tool

In mid-November 2021, the Local Government Association (LGA), launched an online tool[53] to map skills provision and national employment. The LGA, which represents local authorities in England and Wales, aims to help the sector maximise employment and skills support currently available as well as develop a partnership between local and national government to design a system that works for all communities.

The tool illustrates provision in every local authority in England. The project identifies 22 nationally contracted programmes and described a further 27 programmes that are not contracted, with the aim to review the list in 2022.

LoCASE

The Low Carbon Across the South and East (LoCASE) Programme is a partnership between Kent County Council, East Sussex County Council, Essex County Council, Southend-on-Sea Borough Council, Thurrock Council, University of Brighton, West Sussex County Council, Surrey County Council, Rushmoor Borough Council, Basingstoke and Deane Borough Council, Test Valley Borough Council, Winchester City Council, Isle of Wight Council, Portsmouth City Council, Southampton City Council, and the University of Portsmouth.

The programme is supported by the European Regional Development Fund to a provide free business support programme to those in the South and East, with targeted support on offer for companies who offer "green" or low carbon goods / services. LoCASE is an example of best practice in relation to supporting and equipping SMEs with funding, information and skills to adapt to a low carbon economy.

Essex Developers Group

The Essex Developers Group (EDG) is a partnership that works with the government, Homes England and South East Local Enterprise Partnership (SELEP) to accelerate housing delivery and affordable homes.

[53] Local Government Association GA (2021), 'Mapping national employment and skills provision' [online] available at: Link [18.11.21]

I-Construct

The aim of the I-Construct project is to help small to medium-sized companies in the construction and built environment marketplace access new business opportunities through embracing innovation. They offer three types of support:

1. I-Construct network – helps eligible SMEs to join local supply chains, access new business opportunities, network with other industry professionals
2. Mentoring and expert advice
3. Grant funding - £1,000 - £20,000 grants for SMEs in construction

Berkeley Homes and West London College Academy

One of the country's first purpose-built construction academies was launched in 2018 with the aim of tackling the UK's building skills crisis and stopping the exodus of talent from the industry. The state-of-the-art West London Construction Academy is situated on Berkeley's 88-acre regeneration site in Southall and delivered in partnership with West London College. All apprentices benefit from individual support from business champions and mentors.

A similar college academy or skills academy collaboration should be explored within the Essex context, bringing together existing and new provision to support the proposed garden communities and other national strategic projects in the region.

Nissan UK Skills Foundation, Sunderland

In 2014, Nissan announced a major expansion of its school's engagement activities in the UK, using electric vehicles, motorsports and its manufacturing excellence to excite young people about careers in industry. In the years since the UK Skills Foundation was launched, over 65,000 young people have been reached[54].

Similar skills sharing opportunities could be considered for larger businesses in Essex. For example Ford's Dunton Technical Centre or Woods Air Movement in Colchester.

Offshore wind supply chain plans

As part of planning and consenting offshore windfarm developers are required to create supply chain plans that help address any potential skills shortages. Each plan covers the topics below for development, constriction, operations and maintenance and decommissioning phases of the project:

- Skills commitment
- Assessment of future skills requirements
- Assessment of skills gaps
- Investment in skills and training
- Apprenticeships
- Best practice and lessons learnt

Responsible development of supply chains is important for all sectors as we move to a net zero economy. A similar approach could also be applied to other large projects or sectors, forcing routine consideration of green skills.

[54] Fossdyke. J., (Jun 2021), 'Nissan Sunderland aims to inspire kids as Qashqai production begins' [online] available at: Link [18.11.21]

Engineering Construction Industry Training Board (ECITB)

The Engineering Construction Industry Training Board (ECITB) is an employer-led skills, standards and qualifications body for the development of the engineering construction workforce of the UK and reports to the Department for Education.

In preparation for net zero, the ECITB has curated a publicly available list of some of the current training options from national institutions to help a prospective workforce source training / upskilling opportunities such as those detailed in the list below. The format of the courses listed below are either taught in person or online, dependent on the provider.

Bioenergy	Biofuels and Biorefining
	Chemical Engineering with Biorefining
	Biogas
Carbon Capture	Climate Change: Carbon Capture and Storage
	Carbon Capture, Utilisation and Storage (CCUS)
	Carbon Capture and Removal Methodology Advances and Current Status
Carbon Management	Carbon Management for Business
	Sustainable Growth Bootcamp
Circular Economy	Circular Economy Masterclass
Digitalisation and Data	Advanced Digital Energy Systems
	Data management training – how to get value from your data
Energy Systems	Energy Systems and Thermal Processes
	Energy Transition Systems and Technologies
	Assessing Sustainable Power Generation Options
Energy Transition Leadership	Sustainability and Energy Transitions
	Global Environmental Change
	Business and Climate Change: Towards Net Zero
Hydrogen	Hydrogen Energy
	Hydrogen Technology Changes
	The New Hydrogen Economy – A practical guide

Hydrogen	Hydrogen Industry Fundamentals
	A Practical Guide for Market Entrants – Hydrogen Economy
	An essential guide to renewable ammonia
	An essential guide to hydrogen safety
	Hydrogen Energy Expert Certificate
Management and Finance	Energy economics and policy
	Renewable Energy Management and Finance
	Finance and Risk in the World of Energy
	Economics of Energy Transition
	Energy Markets of Today
	The transition to the Decarbonised Economy of Tomorrow
	Creating a pro-renewables Environment
Offshore	North Sea Energy
Renewable Energy	Renewable Energy Engineering
	Offshore Energy from Oil and Gas to Renewables
	Principle of Renewable Energy Technologies
	Renewable Energy Development on Brownfield Land
Solar	Solar Energy Systems
Offshore Wind	Subsea Power Cable

Please note, these courses are not reviewed, delivered or endorsed by ECITB, but have been listed as a helpful signpost to the relevant training opportunities.

Essex Local Nature Partnership (LNP)

Essex is in the process of setting up an independent Local Nature Partnership (LNP) which is a strategic collaboration of a broad range of organisations, groups and individuals committed to working together to tackle ecological challenges and help bring about improvements in the local natural environment.

Through collaboration, a range of skills will be shared across several groups to enhance the nature based solutions within Essex.

7 RECOMMENDATIONS

7.1 Joint Stakeholder Action Plan

The Joint Stakeholder Action Plan brings together the recommendations from this study under 4 headings:

1. The Essex Net Zero Centre of Excellence
2. Raising Awareness
3. Strategic Leadership
4. Collaboration and Partnership

1. The Essex Net Zero Centre of Excellence

ECC and ECAC should lead on the establishment of an Essex Net Zero Centre of Excellence (ENZCE) which galvanises and aligns partnership work around green skills in the county:

- ENZCE will provide support and coordination for existing and potential future education and upskilling providers in Essex
- It will provide online access to a hub of experts and expertise for both individuals, SMEs and businesses to utilise
- ENZCE will also act as a focus point to disseminate examples of good practice to relevant stakeholders
- Education and upskilling will continue to be delivered through the existing network of FE, HE and skills providers
- ENZCE should consider micro-modules, enabling rapid and relevant upskilling from level 1 top-ups for school leavers with progression opportunity at level 2 and above to create work-ready capabilities
- Target outcome is to increase local supply chain capacity to enable Essex and the UK to meet net zero

Priority actions:

a. Scope ENZCE concept and potential funding sources
b. Agree ENZCE partners (must include local authorities, businesses and education/training providers)
c. Understand deployable resources (people and funds) and create funding proposal targeted at DfE

2. Raising awareness

Rapid flow of information between stakeholders is key to support the increase in demand and supply of green skills. The following communication tools are recommended:

	Tool	Description	Potential Partners
2a	**Green Skills Prospectus**	An online prospectus aimed at 11-16 year old student introducing opportunities for green skills employment in Essex. A child friendly version, aimed for 7-11 year old students, could also allow primary school children to be exposed to green opportunities prior to secondary education	Schools, FE, HE, Business, Local Authorities
2b	**Green Skills Directory**	A directory aimed at 16+ to identify all green skills education, training and upskilling opportunities in Essex	FE, HE, Private Providers, Local Authorities
2c	**Green Skills Business Forum**	A forum bringing businesses and education / training providers together to ensure that needs and opportunities are fully understood, including those of rural and coastal locations	Business (including SMEs), Success Essex Board, SELEP, Schools, FE, HE, Opportunities South Essex
2d	**Green Skills Awareness Training**	Online courses targeted at residents of Essex to raise their baseline understanding of green skills and the opportunities they provide	Local authorities, private providers
2e	**Green Skills: 10 questions to ask**	Ten questions for individuals and businesses should ask themselves to ensure they are adequately informed about green skills. Used to sign post to upskilling resources, such as the ones above	ECAC, ECC, SELEP, local authorities, Business Intermediaries, SMEs, Business Support organisations

3. Strategic leadership

Strong leadership can provide more certainty in the demand for green skills and data to monitor progress. The following leadership activities are recommended:

	Leadership	Description	Potential Partners
3a	**Create Certainty of Demand**	Local authorities and Anchor Institutions to take a leadership position that provides certainty and longevity to the demand for green skills e.g. retrofitting of social housing, investing in electric ECC vehicles.	ECAC, local authorities, Anchor Institutions
3b	**Procurement**	Essex public bodies to establish green procurement policies that must be met and demonstrated in the development of bids. This will drive the upskilling and greening of supply chains. Businesses in Essex to offer training and upskilling opportunities to their supply chains enabling SME's to enhance their green skilled workforce.	ECAC, local authorities, Anchor Institutions, Essex businesses
3c	**Social Value Targets**	Establishing Social Value targets that can stimulate industry to train and upskill supply chains, local residents (specifically considering their circumstances and locality), and increase uptake of apprenticeships in green skilled related roles.	ECAC, local authorities, Anchor Institutions
3d	**Data**	Create accessible data to enable changes in supply and demand of green skills and associated upskilling to be accurately tracked. Key areas: • Analysing how resources or political drivers will affect the geography of demand for green skills across Essex • Documenting the capacity of existing providers and their growth plans • Understanding the levels of new jobs vs re-skilling and upskilling within existing roles	ECAC, local authorities, FE, HE, SELEP

4. Collaboration and partnership

Essex would benefit from more partnerships to discuss and promote green skills

- Partners should include businesses, funders, skills/training/education providers and public bodies.
- Collaboration will better align goals and information across developers, planners, community representatives.
- This will also result in greater opportunities for greater influencing / lobbying and attracting funding such as the DfE Skills Accelerator Programme and the emerging 'Skills Plan for Essex'.
- A partnership approach could also help address the shortage of course leaders through the creating of a 'train the green skills trainer' initiative.
- Partnerships could be established to drive green construction, which is a significant sector in Essex.
- Business and industry to actively collaborate with partnerships to identify challenges and solutions in green skills knowledge gaps.
- SMEs encouraged to engage with partnerships to understand upskilling needs and opportunities to make their operations greener.

It is recommended that ECAC take a leading role in identifying potential partnerships and identify relevant areas of focus to best align green skills supply and demand in Essex.

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9 APPENDICES

Appendix A: Stakeholder consultation

List of stakeholders invited to participate in this review

The stakeholders listed below were identified in liaison with Essex County Council and via other stakeholders. Each were contacted and offered a consultation session.

Agulhas Applied Knowledge

Anchor Institutions

Anglia Ruskin University

Anglian Water

Back to Business Essex

Basildon Borough Council

Basildon and Thurrock University Hospital

BEST Growth Hub

Biomechatronic

Braintree District Council

Brentwood Borough Council

Business Representative on ECC Recovery Board

Castle Point Borough Council

Chelmsford College

Chelmsford District Council

CITB

Colbea

Colchester Institute

Developer Consortium of Chelmsford Garden Community

East of England Energy Group (EEEGR)

Epping Forest District Council

Essex Chambers of Commerce

Essex Climate Action Commission

Essex County Council

Essex Developers Group (EDG)

Essex Planning Officers Association (EPOA)

Essex Providers Network (EPN)

Essex WWT

Federation of Essex Colleges (FEDEC)

Federation of Small Business

Five Estuaries Offshore Wind Farm

Flakt Group

Forum for Future

Freeport East – Hutchison

Harlow Council

Harlow and Gilston Town Partners

Harlow College

Haven Gateway Partnership

Highways England

Iceni

Ingleton Wood LLP: Building Design & Construction Services

Lee Valley Regional Park Authority

LoCase

Lower Thames Crossing

Maldon District Council

Mid and South Essex NHS Foundation Trust

North Essex Economic Steering Board

North Falls Offshore Wind Farm

Opportunity South Essex (OSE)

Rochford District Council

Royal Town Planning Institute

SELEP – Clean Growth Working Group and Skills Advisory Panel

South Essex College

Southend-on-Sea Borough Council

Southend (SECTA)

Success Essex Board

Tendring District Council

Thames Estuary Growth Board

Thurrock Borough Council

UK Innovation Centre

University of Chester

University of Essex

USP College (Castlepoint and Thurrock)

Uttlesford District Council

Writtle University College

Stakeholder engagement questions

As part of the engagement meetings, Mace introduced the project including its aims, background and programme to the participants. This was then followed by a discussion, using the following questions as prompts.

1. What are the priority green skills in your view?
2. Have you come across evidence that demonstrates a demand for green skills? If so, in what sectors?
3. What are the policy / industry / other drivers for increased demand in Green Skills?
4. What is the demand for upskilling and training in Green Skills, in the Essex County at present?
5. What training and upskilling resources are you aware of / do you access?
6. Are there any training or re-skilling opportunities that you think have not received the expected uptake?
7. What initiatives or developments do you think would help address the Green Skills shortage (now, in 5 years, in 10 years)?
8. Are there any particular funding opportunities or partnerships that you consider worth exploring, in order to enhance the green skills offering in Essex?
9. Are there any additional stakeholders that you feel are particularly important be consulted?

Key stakeholder feedback

A summary of the key themes raised by Stakeholders in the consultation sessions is provided below. These themes have been highlighted by numerous consultees, which suggest they are some of the priority challenges that the county faces, in relation to green skills.

Construction

- "Retrofitting of homes will be a priority in meeting net-zero target, but there are an insufficient number of skilled retrofit specialists in the county"
- "Sustainable development targets such as net-zero are being set, but specialist green skillsets not currently available to deliver them at scale yet"
- "Construction work has fallen out of favour in recent years as its reputation as a hard industry has gained momentum. It's physically demanding, with early starts, weather extremes and being self-employed. To bring in the evolving green skillsets into Construction, it is important that young people are made aware of green job opportunities in this sector"

Green knowledge

- "General lack of carbon literacy across stakeholders and all those in Essex County. Everyone could benefit from some training to enhance the level of carbon literacy"
- "People and Businesses in Essex want to be greener, but they don't know how"

Education

- "The Apprenticeship Levy is not working as designed to"
- "Shortage in training providers (teachers and course leaders)"
- "Integration of green skills and awareness into curriculums at all levels, in all subjects is important"
- "STEM subjects are still not getting the desired uptake, and many green skills jobs have a basis in STEM"
- "Many young people want to make a difference, but struggle to access the careers resources to make informed decisions"

Business and Industry

- "Essex is made up of predominantly SMEs, who are unlikely to upskill / retrain unless there a monetary incentive"
- "There are major low and zero carbon energy infrastructure projects commencing in Essex over the next few years, and it is important to use these opportunities to create a green skilled and well-paid Essex work force"
- "Small businesses struggle to afford the time to engage"

Appendix B: LCREE industry data

Section 3.3 utilises data from the ONS Low Carbon and Renewable Energy Economy Estimates (LCREE) (2019, published 20 May 2021). The survey data of this report has been provided by UK governmental stakeholders who were consulted, and a target population of 72 two-digit Standard Industrial Classifications (SICs) were agreed upon, as shown in Table 12.

Table 12 SIC code divisions used in LCREE data collection

Division	Description
01	Crop and animal production, hunting and related service activities
02	Forestry and logging
05	Mining of coal and Lignite
07	Mining of metal ores
08	Other mining and quarrying
12	Manufacture of tobacco products
17	Manufacture of paper and paper products
20	Manufacture of chemicals and chemical products
22	Manufacture of rubber and plastic products
23	Manufacture of other basic non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Machinery of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
32	Other manufacturing
35	Electricity, gas, steam and air conditioning supply
36	Water collection, treatment and supply
37	Sewerage

Division	Description
38	Waste collection, treatment and disposal activities; materials recovery
39	Remediation activities and other waste management services
41	Construction of buildings
42	Civil engineering
43	Specialised construction activities
45	Wholesale and trade and repair of motor vehicles and motorcycles
46	Wholesale trade, except of motor vehicles and motorcycles
49	Land transport and transport via pipelines
52	Warehousing and support activities for transportation
53	Postal and courier activities
62	Computer programming, consultancy and related activities
68	Real estate activities
69	Legal and accounting activities
70	Activities of head offices; management consultancy activities
71	Architectural and engineering activities, technical testing and analysis
72	Scientific research and development
74	Other professional, scientific and technical activities
77	Rental and leasing activities
78	Employment activities
81	Services to buildings and landscape activities
82	Office administrative, office support and other business support activities
85	Education
94	Activities of membership organisations
96	Other personal service activities

Table 13 below includes a list of the industries (divisions) that were excluded from the analysis.

Table 13 SIC code divisions excluded in the LCREE data collection

Division	Description
03	Fishing and aquaculture
06	Extraction of crude petroleum and natural gas
09	Mining support service activities
10	Manufacture of food products
11	Manufacture of beverages
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
31	Manufacture of furniture
33	Repair and installation of machinery and equipment
47	Retail trade, except of motor vehicles and motorcycles
50	Water transport
51	Air transport
55	Accommodation
56	Food and beverage service activities
58	Publishing activities
59	Motion picture, video and television programme production, sound recording and music publishing activities
60	Programming and broadcasting activities
61	Telecommunications

Division	Description
73	Advertising and market research
75	Veterinary activities
79	Travel agency, tour operator and other reservation service and related activities
80	Security and investigation activities

Appendix C: Drivers

Existing legislation, policy and research

Net Zero 2050

In June 2019, the UK Government committed to being 'net zero' for all greenhouse gas emissions by 2050. To solidify this target, The Climate Change Act (originally passed in 2008 committing to the UK to an 80% reduction of greenhouse gas emissions compared to 1990 levels), was amended to increase the UK's commitment to a 100% reduction by 2050.

In the months following the enhanced target, many local authorities around the UK, including several from the Essex County, declared climate emergencies and committed their regions to even more stringent targets, including reaching net zero by 2030. In order to achieve the targets set, the UK must transition to a clean energy economy, dominated by renewables instead of fossil fuels. Solar and wind power are to receive heavy investment in the upcoming years, particularly offshore wind, taking advantage of the UK's abundant marine space.

The Ten Point Plan for a Green Industrial Revolution

In November 2020 the Government published their Ten Point Plan that sets out the government's approach to build back better, support green jobs, and accelerate the UK's path to Net Zero. The Ten Points that have been established as the key sectors for the 'Green Industrial Revolution' are shown below.

Many of the sectors and industries outlined in the ten points align with the priority green skills that have also been identified during the stakeholder engagement sessions. Points 1, 2 and 4 in particular, reference Renewables, Hydrogen and transport, have been referenced in every stakeholder consultation session and are key sectors that the local stakeholders believe will be of significant importance to the Essex economy.

Net Zero Strategy: Build Back Greener

Since the release of their Ten Point Plan, the Government are stated to have mobilised £26 billion of governmental capital investment for the green industrial revolution, which is confirmed in the very recent publication of the Net Zero Strategy to 'build back greener' (October 2021).

This national policy document sets out key policies that have the potential to support up to 190,000 jobs by 2025, and up to 440,000 jobs by 2030. The government expect that these jobs will contribute to their wider ambition of 2 million green jobs by 2030, which also factor in employment that contributes to other environmental goals (beyond The Ten Point Plan). The Strategy reports that around 56,000 green jobs have been secured or created across the UK economy since the release of The Ten Point Plan, with some being already online and others in the pipeline over the next decade.

Green Skills Task Force

The Green Jobs Taskforce was launched on 12 November 2020 to set the direction for the job market as the UK transitions to a high-skill, low carbon economy.

The taskforce was asked to look at the following challenges and advise government, industry and the skills sector on how to realise the UK's ambitions for green jobs:

- the skills needed to drive a green recovery from the COVID-19 pandemic
- the skills needed to reach net zero greenhouse gas emissions by 2050
- how the UK can ensure green jobs are good jobs, and open to all
- how workers in high carbon-sectors can be supported to transition to the new green economy.

Build Back Better: our plan for growth

Published in March 2021, HM Treasury's 'Build Back Better' policy paper aims to tackle long-term problems to deliver growth that creates high quality jobs across the UK. The pandemic, combined with the UK's departure from the European Union, presents many opportunities to do things differently and drive growth. Illustrated in the report are three core pillars of growth for 'building back better' - Infrastructure, Skills and Innovation. Growth in these three areas will ensure the whole of the UK is levelled up, the transition to Net Zero is supported, as well as the vision for a Global Britain.

Of particular interest is the investment in net zero jobs, including up to 60,000 jobs in the offshore wind sector, 50,000 jobs in carbon capture, usage and storage and up to 8,000 in hydrogen. The government realises that education is at the heart of these jobs, so has made significant capital investments in post-16 education as part of the policy. This includes £268 million to support the roll-out of T levels, £270 million to establish 20 Institutes of Technology, and a greater budget fund for apprenticeships.

Maritime 2050

One of the strategic ambitions of the Maritime 2050 policy paper (published in January 2019) is for the UK to lead the way in taking action on clean maritime growth and reaping the economic benefits from being an early adopter/fast mover in a greener maritime sector. In their Ten Point Plan, the government have committed to investing £20 million into the Clean Maritime Demonstration Programme.

The policy paper set out a short-term trade recommendation for government to engage with the ports and manufacturing industry to consider the case for free ports in the UK. This has since been progressed and eight new free ports have been announced, including Felixstowe and Harwich which has been coined 'Free Port East'.

Circular Economy Action Plan: The European Green Deal

Published in March 2020, the EU's circular economy action plan hopes that by switching to such an economy, pressure on natural resources will be reduced, and sustainable jobs and growth will be generated. The report suggests 700,000 new jobs could be created across the EU by applying circular economy principles, having already grew by 5% to 4 million between 2012-18.

The report is clear in its support of skills and job creation, including in the context of updating its Skills Agenda, launching a Pact for Skills with large-scale multi-stakeholder partnerships, and the Action Plan for Social Economy. Further investment in education and training systems, lifelong learning, and social innovation will be promoted under the European Social Fund Plus.

Expected legislation, policy and research

Environmental Bill 2020

Having been through the House of Commons and House of Lords, the Environmental Bill 2020 is in the final stages of review prior to being implemented into legislation later in 2021. The Bill will bring about the legal-binding targets to combat the environmental and climate crisis facing the UK. The targets set out are expected to provide a long-term mechanism to deliver the government's 25 Year Environment Plan published in January 2018.

After publication, the public spending watchdog warned that the Bill will be undermined by a skills shortage. DEFRA, in particular, are struggling to recruit and retain certain green skilled jobs due to competition from the private sector.

Skills and Post-16 Education Bill

As of October 2021, the Skills and Post-16 Education Bill is currently being debated in the House of Lords. The reforms outlined in the Bill will help to create more routes into skilled employment in sectors the economy needs such as engineering, digital, clean energy and manufacturing. One of the main benefits of the Bill includes offering adults across the country the opportunity to retrain throughout their lives through the Lifetime Skills Guarantee, helping them to gain in-demand skills and open up further job opportunities. The Bill has a focus on realigning the system around employer needs; this ensures people are trained for the skills gaps that exist now and, in the future, in sectors

the economy needs. Ultimately, the Bill aims to ensure more people secure well-paid jobs in their local areas, levelling up the nation and supporting communities.

Future Homes/Buildings Standard 2025

The Future Homes Standard is a set of standards that will complement the Building Regulations to ensure new homes built from 2025 will produce 75-80% less carbon emissions than homes delivered under current regulations.

The standard will comprise a series of amendments to Part F (ventilation) and Part L of the Building Regulations for new homes.

Once the legislation is passed 2025, all new homes will have to be built according to the standards.

PAS 2035

PAS 2035 is the new energy efficiency retrofit standard with an updated specification for the energy retrofit of domestic buildings.

Skills for Jobs: Lifelong Learning for Opportunity and Growth

In January 2021, the UK Government launched this long-awaited White Paper. In the document, the skills gap within the UK is recognised and there is a strong drive to address this. It sets out the new £2.5 billion National Skills Fund to enhance the funding to support adults to upskill and reskill.

Government Digital Strategy (2017)

This strategy sets out how we will develop a world-leading digital economy that works for everyone. It has seven strands:

- Connectivity - building world-class digital infrastructure for the UK
- Skills and inclusion - giving everyone access to the digital skills they need
- The digital sectors - making the UK the best place to start and grow a digital business
- The wider economy - helping every British business become a digital business
- Cyberspace - making the UK the safest place in the world to live and work online
- Digital government - maintaining the UK government as a world leader in serving its citizens online
- The data economy - unlocking the power of data in the UK economy and improving public confidence in its use

Appendix D: Glossary

Bioenergy: Renewable energy derived from biomass or biofuel

CPD: Continuing Professional Development
ECAC: Essex Climate Action Commission
ECC: Essex County Council
EDG: Essex Developers Group
ESG: Environmental, social, and governance (ESG) criteria are a set of standards for a company's operations that socially conscious investors use to screen potential investments
FTE: Full-time equivalent employees
Further Education: The education of people who have left school but who are not at a university or a college of education (aged 16-18)
HESA: Higher Education Statistics Agency
Garden Communities: Large scale new developments that will create well-planned, sustainable places for people to live. Job opportunities, green space and low carbon transport infrastructure are prioritised.
Green Growth: The Organisation for Economic Co-operation and Development (OECD) defines green growth as fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our wellbeing relies.
Greenhouse Gases: Gases such as carbon dioxide, methane and ozone which trap heat
Ground Source Heat Pump: A heating/cooling system for buildings that transfers heat to or from the ground, taking advantage of the relative constancy of temperatures of the earth through the seasons.
Higher Education: Education at universities or similar educational establishments, leading to the award of an academic degree (aged 18+)
Hydropower: Renewable energy which uses the natural flow of moving water to generate electricity e.g. through mills or dams
Linear Regression Analysis: Predicting a future trend based on historic data
Net Zero: A state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere.
SELEP: South East Local Enterprise Partnership
SIC: Standard Industrial Classification
SME's: Small and Medium Sized Enterprises
STEM: Science, technology, engineering and mathematics
Upskilling: To provide someone, such as an employee, with more advanced skills through additional education and training

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