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Preface

Technological change, globalisation, ageing populations and climate change dramatically increase the pace of change in labour market and skill needs, for new and current jobs alike. The growing importance of sustainable development and the shift to a low-carbon economy imply structural changes across sectors and occupations. This shift leads to new 'green' jobs and 'greening' of existing ones that translate to new skill sets, update of curricula or even new qualifications; for example, the adoption and dissemination of clean technologies requires skills in technology application, adaptation and maintenance.

Skills gaps are already recognised as a major bottleneck in sectors closely linked to 'green economy', such as renewable energy, energy and resource efficiency, renovation of buildings, construction, environmental services, manufacturing. At the same time, the 'greening' of the economy creates skill needs across other sectors, as businesses, workers and entrepreneurs have to rapidly adapt to changes as a consequence of environmental policies.

Given the challenges, Cedefop and ILO joined forces in 2010 and produced the report *Skills for green jobs: a global view* (ILO, 2011). The research was based on 21 country studies with a primary focus on good practice examples of how national policies for greening economies are complemented by identification of skills needs and efficient skills response strategies. Cedefop covered country studies (Cedefop, 2010a) in six EU Member States: Denmark, Estonia (Cedefop, 2010b), France, Germany, Spain and the UK. All studies were conducted based on the same research methodology and criteria for selection of case studies, and following identical structures.

In 2017, these studies were updated for the ILO flagship report *World employment and social outlook (WESO) 2018: greening with jobs*, published in May 2018 ⁽¹⁾. The country studies were used as background material for chapter 5 of the report on *Skills for the green transition* with the objective to analyse the trends towards decent work and environmental sustainability since 2010; and assess the impact of a transition towards a low-carbon, resource-efficient economy on the world of work.

This country report was produced by Cedefop, Department for skills and labour market, under the supervision of Alena Zukersteinova. Stelina Chatzichristou, Cedefop expert, was responsible for the research conducted from April 2017 to October 2017.

Cedefop would like to acknowledge the research team of the consortium led by Fondazione Giacomo Brodolini who conducted preliminary analysis and drafted their findings under project team leader Andrew McCoshan.

The full country reports are unedited and available only electronically. They are used as background information for Cedefop's synthesis report *Skills for green jobs: 2018 update* ⁽²⁾.

⁽¹⁾ Available from: https://www.ilo.org/weso-greening/documents/WESO_Greening_EN_web2.pdf

⁽²⁾ Available from: <http://www.cedefop.europa.eu/en/publications-and-resources/publications/3078>

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Executive summary

In recent years, Estonia has invested substantially in reforming its skills anticipation process, including the newly launched System of Labour Market Monitoring and Future Skills Forecasting (OSKA). That has both improved the involvement of stakeholders and created a systematic process for skills anticipation. However, green economy, green skills and green jobs are not explicitly part of the system and are developed horizontally. In Estonia, green jobs and green skills are spread between different economic sectors and policy areas and there is no coherent training approach or framework. Coherence between skills development policies, environmental and climate change policies has not radically improved in recent years (as this has not been the priority); therefore, no comprehensive and systematic linkages (e.g. goals, activities, measures) between them are in place. Basic coordination of any policy area is ensured by the fact that priorities in higher-level horizontal development plans and strategies must be included or followed in lower level documents; in practice though, inclusion and linkages between policies may be weak. Despite the lack of formal definitions, various documents and expert opinions suggest that the OSKA system (Section 4.1) is the solution for identifying specific green skills and jobs needed in different sectors.

1. Introduction

Rapid movements in the global technological frontier, combined with changes in the population structure and the influence of climate change are reshaping the labour market and skills anticipation for future jobs. Together with the rising awareness and emphasis on sustainable development, various green jobs will emerge and existing jobs will also require new competences to adapt to the changing conditions.

The aim of the country report is to cover the main developments in the field of green economy, green jobs and skills anticipation system in Estonia. The report presents the main policy and strategy responses in education and employment and describes skills development measures and skills anticipation activities applied, including changes in vocational education, technical training and retraining possibilities. The methodological approach combines six interviews with relevant stakeholders and desktop research.

In Estonia, the term 'green economy', 'green jobs' and 'green skills' are not widely used and typically 'environmentally friendly economy', 'sustainable economy' but also 'eco-economy' are applied instead. Green economy and 'green thinking' are typically more pronounced in sectors like energy, transport, construction, agriculture and forestry. The strategies and policies of these sectors will be covered in the report.

2. Major changes in the economy and employment shifts in the green transition after 2009-10

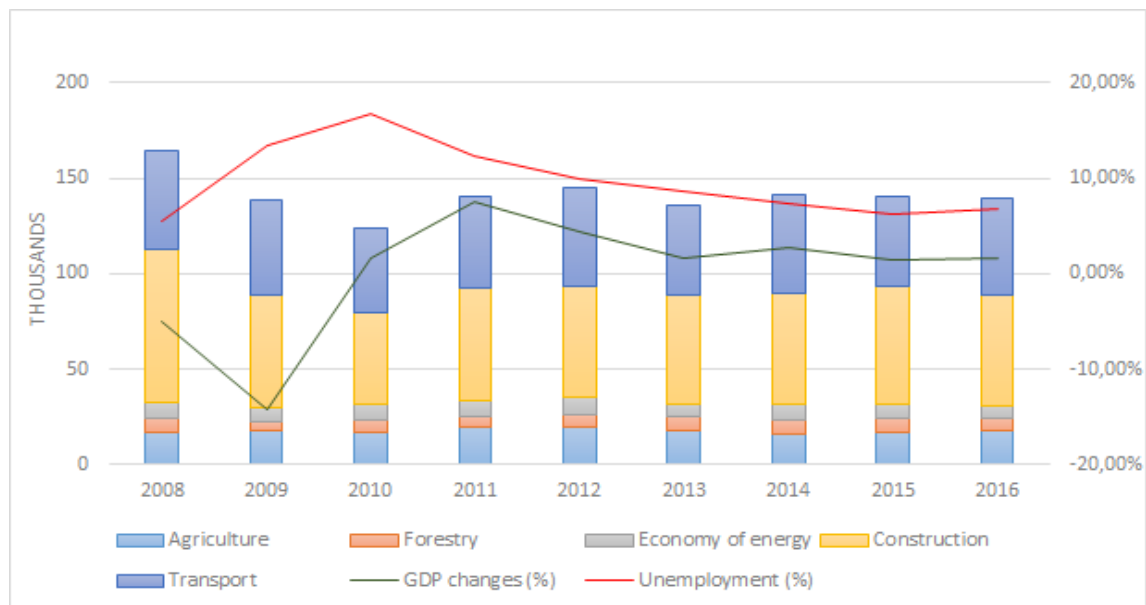
The economic contraction in Estonia following the global financial crisis was fierce. The unemployment rate for males, young people and non-natives rose sharply and particularly in sectors like agriculture, construction and manufacturing. The subsequent policy response by the government was to freeze public sector expenditures and to intensify the use of support from the European Union (EU) structural funds, which allowed the maintenance of a balanced budget and implementation of active labour market policies at the same time. Estonian enterprises responded with productivity enhancing adjustments and decline in wages to support their competitiveness. The subsequent recovery in Estonia has been relatively quick, albeit volatile. The volatile dynamics could be explained by domestic factors as well as with the generally vulnerable environment in Europe. The outlook for 2017 is however more positive and this is manifested by the 4.4% and 5.7% growth in the first and second quarter.

According to expert views, since 2010 green policy, green technologies and green regulations have had an influence on the labour market, on jobs and on required skills and, although these changes take time, they are nonetheless evident. Stricter environmental regulations require employees who know how to satisfy to adhere to these regulations and rules. On the other hand, there is a need for people who know how to monitor and control whether and how regulations are followed.

Reportedly green jobs and demand for green skills are currently most evident in sectors like agriculture, forestry and industry, renewable energy economy, transport (including public transport), in hand-made and recycled crafts and design and also in the education sector (e.g. nature, biology teachers, scientists, etc.). Furthermore, waste and circular economy have received great attention and are in need of green workers and green thinking. Some experts argue that all jobs that value environment, environmental care and turn attention to sustainable production and consumption and sustainable development should be considered as green jobs. Furthermore, the public sector is seen as one important sector where the share of green jobs is noticeable and that could be in the forefront of green thinking and good practice. Last but not least there are large enterprises that operate in sectors where environmental risks are high, e.g. energy economy, paper and chemicals industry. There are some noteworthy enterprises e.g. Viru Keemia Grupp (VKG, the largest manufacturer of shale oil and chemicals in Estonia and Europe), Eesti Energia (operates on oil shale and energy production) and Estonian Cell (the largest producers of market pulp and magazine paper in Central and Eastern Europe) that due to the nature of their operations could potentially create positions for green jobs. The following sections provide insights into economic changes and labour market shifts in the most relevant economic sectors related to the study.

Figure 1 shows the number and share of workers (aged 15-74) in each economic sector in 2008-16. The most remarkable changes have occurred in construction: as the result of the housing bubble, 80 600 (12.3% of all employees) were employed in 2008, by 2010 the number had decreased to only 44 400 (8.4% of all employees). However, since 2011 the number of employees in construction has gradually increased. Agriculture, forestry and energy sectors have not experienced significant changes in the number of employees during this period. Small changes are also apparent in the transport sector.

Figure 1: Changes in GDP, unemployment rate and the number and share of employees in each studied economic sector 2008-16



Source: Statistical Office of Estonia.

Figure 1 also illustrates simultaneous changes in GDP ⁽³⁾ figures and unemployment rate. After a 14.2% decrease from the previous year, Estonia's GDP was at its lowest point in 2009, followed by a steady yet fluctuating increase. Labour market indicators have improved since 2010. In 2016 the employment rate for the age group 20-64 climbed to 76.6%, almost reaching the pre-crisis level ⁽⁴⁾. The unemployment rate has gradually improved since the crisis – from 16.7% in 2010 to 5.6% in 2017 (first quarter). See Annex 1 for more details about economic and social changes in Estonia after 2009.

When before the crisis 17 different Active Labour Market Policies (ALMPs) were in place, in 2017 this figure increased to almost 40. However, long-term and structural unemployment has remained relatively high indicating that labour market mismatches persist (Espenberg et al, 2017).

⁽³⁾ GDP: gross domestic product.

⁽⁴⁾ Statistics Estonia.

Table 1: Forecasted number of employees (000s).

	2017	2018	2019	2020	2021	2022	2023	2024
Agriculture	16.6	16.5	16.5	16.4	16.3	16.2	16.2	16.1
Forestry	7.4	7.4	7.5	7.5	7.5	7.5	7.6	7.6
Economy of energy	10.6	10.5	10.5	10.4	10.4	10.4	10.3	10.3
Construction	58.7	58.6	58.5	58.4	58.3	58.2	58.1	58.0
Transport	43.8	43.8	43.7	43.6	43.6	43.5	43.5	43.4
Total								635.1

Source: Statistical Office in Estonia, Ministry of Economic Affairs and Communications.

The employment rate is expected to decline in agriculture, clothing and retail trade (Table 1). According to experts, employment growth is expected in the wood industry and in the production of electronic and electrical equipment. The share of highly qualified professionals is increasing, while employment in the rest of professional groups is decreasing. By the year 2024, the number of highly qualified professionals is expected to increase to 15 100 and the number of unskilled workers to decrease to 4 200 (Majandus- ja Kommunikatsiooniministeerium, 2016).

The importance of new green jobs in Estonia is debatable among experts. The latter stress that although the number of green jobs in the country is growing, its share in total jobs is modest. The need to create green jobs concerns the public sector, and stems from national and local regulations, that demand for environmental specialists (e.g. in local government). The relevance of green jobs is also evident in larger industrial enterprises and in enterprises that are more affected by the environment (e.g. they use natural resources). The labour force prognosis indicates that the demand for people in or related to green jobs is greater than the supply, hence experts rate the importance of green jobs in Estonia highly. Others are of the opinion that the green economy and green jobs are a niche, meaning that 'green' products/services are more costly and in a way they are exclusive, and thus are of little importance to the labour market.

One possibility to increase and speed up the need for green skills and green jobs is increasing the share of green public procurement in the public sector, thus giving and leading by a positive example and thereby influencing consumption and production patterns in the country overall. In 2016, the share of green public procurement in public procurement was about 5.7% (Heinma, 2016). The use of environmental criteria in public procurement is modest, as the public sector uses mandatory environmental regulations and criteria only regarding vehicles; however, the plan is to expand these regulations to four new product and service groups: copy and drawing paper, cleaning products and services, office IT equipment, and furniture.

In the mid-term perspective, the Estonian labour market will be most influenced by labour shortages, i.e. it will be difficult to find appropriate people for jobs (including green jobs). According to expert views, employers are more interested in filling jobs that add more value, and green jobs may not be among them (at least in the short run). On the other hand, as environmental awareness is rising and interest towards producing-consuming environmental friendly products and services, demand for these specialists/employees will

probably increase. Another challenge that will affect the nature of various jobs in the near future is automation; some jobs will disappear and some new jobs will be created. Whether the content of these new jobs, and thus the skills needed for them, will be relevant to environmental and sustainable development will again depend on consumer preferences. Consequently, increasing general awareness of environmental friendly production-consumption will be very important.

Turning to the sectors in more detail, the below observations can be made.

Agriculture

As agriculture is an economic sector that is dependent on natural resources, it has an important role to play in the emergence and creation of green jobs. The number of agricultural establishments has been relatively stable in post-crisis years ⁽⁵⁾ but the number of employees has declined mostly due to increasing automation. Despite the decreased share of agriculture in the economy, it retains its important role in boosting rural businesses and culture (Värnik et al., 2012).

Forestry

Forests are one of the most important natural resources in Estonia. The green activities in forestry focus on improving energy efficiency and promoting CO₂ sequestration, exploiting side products, waste, scrap and other raw materials for the benefits of bio-economy (Värnik et al., 2012).

The increased use of machinery has significantly reduced the number of unskilled workers in forestry while increased the need for skilled and specialist workers. Employment for both unskilled/low-skilled and specialists in forestry and wood industry is expected to grow slightly in the future (Lambing et al., 2016). A good example of green thinking and circular economy is the successful export of wooden houses (e.g. log, modular houses) where the principles of nature friendliness, energy efficiency, healthiness and sustainability are emphasised.

Currently there is a heated debate in the country over the future of forestry and related legislation. The main concern is the sustainable and diversified development of Estonian forests (e.g. sustainable logging/forest management, motivating private forest owners to manage their forests, etc.) (Korjus, 2017; Ploompuu, 2017; Soopan, 2016). Employment in logging/forest management will be affected by the lowering of the age at which wood is harvested, resulting in the need for more capable, intense and refined forest management practices, i.e. up-skilling of forest owners and managers. Consequently, workers will need knowledge and skills on how to manage forests in a sustainable and efficient way to adhere to the demands of the new forestry legislation.

⁽⁵⁾ Statistics Estonia: http://pub.stat.ee/px-web.2001/Database/Majandus/13Pellumajandus/02Pellumajanduse_majanduslik_arvepidamine/02Pellumajanduse_majanduslik_arvepidamine.asp

Construction

Changes in skills needs are driven by the environmental requirements of relevant legislation. The emphasis in Estonia is on energy efficiency of buildings but also on using environmentally friendly materials and technologies, evaluating the influence of used materials and technologies on people's health. As construction is becoming gradually more interdisciplinary, there is a need to improve cooperation between the relevant stakeholders and thereby reach a mutual understanding about how to achieve energy saving. Success depends on the competences and will of all concerned parties (Värnik et al., 2012).

Transport

Strategic documents for transportation in Estonia mostly focus on the reduction of greenhouse gas emissions and energy consumption, but also noise reduction. Current trends in transport and people's movement patterns are not considered ecologically sustainable. The biggest challenges in transportation relate to heavy car use, slow improvements in the energy efficiency of the vehicle fleet, rapid growth of road transportation and decline in rail transportation, urban sprawl, decline in the share of public transport and non-motorised traffic (Värnik et al., 2012).

Energy sector

Estonia is one of the least dependent on energy imports EU countries, thanks to the use of oil shale and increasing share of renewable fuels. However, these types of fuels lead to relatively high per capita greenhouse gas emissions. Thanks to the marine cables between Estonia and Finland and the improving connection to Latvia the electricity market is relatively open and transparent. The long-term perspective would be the transformation of oil shale based energy with low-carbon sources. This will have to be a carefully considered process with provision of comprehensive vocational retraining programs for the current workforce in energy sector.

3. Key policies and regulations

There is no separate strategy document that simultaneously and comprehensively addresses green economy and has clear linkages with the creation of green jobs and the development of relevant skills. Most green economy measures that influence both jobs and skills have been implemented under the environmental policy framework ⁽⁶⁾ and at sector/area-level (e.g. forestry, climate) and are rarely if at all linked to labour and skills policies.

Coordination of various policy areas and thus linkages between them is ensured by the fact that priorities in what are termed national 'horizontal' ⁽⁷⁾ development plans and strategies must be included or followed in lower level documents; this is however not always successful so, linkages may be weak in practice. There are altogether three horizontal development plans: 'Sustainable Estonia 21', the central reform programme/the competitiveness plan 'Estonia 2020' ⁽⁸⁾ and the 'National Security Concept of Estonia'. Lower level development plans are designed taking into account the general guidelines and principles in higher, horizontal development plans. Although they usually do refer to horizontal development plans, linkages may be weak and superficial. The newly launched OSKA system (Section 4.1) is seen as the coordination mechanism and a solution in identifying specific skills and jobs needed in different sectors and areas.

'Sustainable Estonia 21' ⁽⁹⁾ (Ministry of the Environment, 2005) is a horizontal national strategy on sustainable development for the period to 2030. Inter alia, the strategy covers the most important challenges in education and future skills. Long-term development of the natural environment is governed by the goal 'ecological balance' consisting of topics such as the use of natural resources and ecological balance, minimising pollution and conservation of biodiversity and natural areas. However, there is no specific focus or reference to green skills or jobs.

The central reform programme, the competitiveness plan 'Estonia 2020' (Vabariigi Valitsus, 2017), describes and shapes the most important objectives and activities to improve the competitiveness of the state. It also addresses the issue of labour supply. Whereas the short-term focus is on education and increasing employment, the need to reduce youth and long-term unemployment and the promotion of vocational retraining and skills development are also addressed. Raising the skills of employees is recognised as an essential activity to achieve the goal of higher productivity but also to maintain high employment levels.

⁽⁶⁾ Keskkonnaministeerium. Analüüs ja planeerimine: <http://www.envir.ee/et/analuus-ja-planeerimine>

⁽⁷⁾ Horizontal development plans and strategies are the most important to be followed because they are approved or adopted by the Estonian Parliament or Estonian government and not by a specific ministry (not addressed to a specific ministry).

⁽⁸⁾ National Reform Programme 'Estonia 2020': <https://riigikantselei.ee/en/supporting-government/national-reform-programme-estonia-2020>

⁽⁹⁾ <https://www.riigiteataja.ee/akt/940717>

According to the plan, up-to-date skills enable people to cope with new jobs and changes in the structure of the economy. 'Estonia 2020' also promotes the construction and reconstruction of energy efficient buildings, green transport, use of renewable materials and recycling of waste, circular economy, bio-economy, although there are no direct linkages to the development of necessary skills or creation of jobs. Nevertheless, the OSKA system is seen as a solution in identifying specific skills and jobs needed in different sectors, which correspond to the needs of society.

The goals and measures of 'Sustainable Estonia 21' and 'Estonia 2020' are supported by the 'Estonian Lifelong Learning Strategy 2020' (Valitsus, 2014), which serves as the central strategic document for skills development and lifelong learning. The general goal of the Lifelong Learning Strategy is to provide all people in Estonia with learning opportunities tailored to their needs and capabilities throughout their whole lifespan. The strategy especially emphasises the need to develop creativity and the entrepreneurial spirit, problem solving and teamwork skills, critical thinking, analytical skills and digital competence. However, green skills are not mentioned. One strategic goal under the general goal is to maintain concordance of lifelong learning opportunities with the needs of labour market. One obstacle mentioned in the strategy is the mismatch of skills and the lack of collaboration between education institutions and representatives of employers to develop a lifelong learning system.

Similarly, in several strategy documents (Annex 2) as a solution to mismatch in skills and poor collaboration between education institutions and representatives of employers, OSKA's sector skills councils are seen as expert bodies that monitor, analyse and project future labour market developments; and also that act as social partners for the Ministry of Education and Research in deciding on the relevance of the contents of the qualifications in a certain field, as well as in informing society about development directions in their field (sectors). The OSKA Coordination Council is emphasised as an expert committee combining experts from different fields that is in charge of planning and commissioning analyses and prognoses. The committee informs the public of the current trends and advises the Ministry of Education and Research, the Ministry of Economic Affairs and Communications, and the Ministry of Social Affairs on the disciplinary division of the budget allocated to initial and in-service education. Another way in which the mismatch between the education system and labour market is reduced is through joint councils, bodies, cooperation networks, etc. Educational institutions cooperate with employers and involve relevant stakeholders in curricula design and teaching but also through apprenticeship and internship cooperation. Employers' and workers' representatives are also present in Estonian Unemployment Insurance Fund [Eesti Töötukassa] councils and in the Estonian Qualification Authority councils ⁽¹⁰⁾.

⁽¹⁰⁾ Estonian Employers Confederation: <https://www.employers.ee/meist/>; Estonian Trade Union Confederation: <http://www.eakl.ee/moju-teemad/osaleme>

In general, social partners in Estonia are involved in the decision-making process and in the development of strategy documents, regulations and policies. This mostly happens through the activity of their representative organisations but it is also possible to send individual ideas or proposals to the government through a web platform 'osale.ee' ⁽¹¹⁾. It is also possible to follow legislation drafts and their progress, to participate in public consultations and to comment on drafts in progress in a work environment/platform 'eelnõude infosüsteem – EIS' ⁽¹²⁾. Another option is to submit a collective proposal by several people through a platform 'rahvaalgatus.ee'. This platform is designed for raising questions such as how to improve existing legislation, and it is possible to submit proposals directly to the Estonian Parliament [Riigikogu]. A collective proposal targeted to the Estonian Parliament should have at least 1 000 signatures in support, given by at least 16-year-old citizens of Estonia ⁽¹³⁾. Furthermore, government authorities engage interest groups, social partners and the general public in the decision-making process according to the Good Public Engagement Code of Practice ⁽¹⁴⁾. To summarise, it is possible to track and monitor the decision-making process in Estonia, as it is virtual, digital and public. Both representative organisations and individuals can take part in the development of regulations, strategy documents, etc.

In 2013, regarding gender equality and green jobs, the Estonian Gender Equality and Equal Treatment Commissioner advised how to take into account gender issues and develop equal opportunities for men and women in designing the Strategy for the Bio-economy 2030 ⁽¹⁵⁾. The strategy covers almost all economic sectors, but the most important of them are agriculture, fishery and forestry that produce or consume biological resources (e.g. food, bait, paper, energy, chemistry industry). Among the suggestions was a proposal to add a survey about the influence of developing bio-economy in Estonia on male and female employment, e.g. horizontal and vertical segregation and gender wage gap. The drafting of the Strategy for Bio-economy is still in progress; therefore, it is not possible to assess the extent to which gender equality will be included in the document. Nevertheless, acknowledging gender issues in green and bio-economy is considered relevant as women are underrepresented in these sectors; moreover, it is considered that women have greater gaps in the skills necessary for the green economy and bio-economy jobs. Therefore, the Estonian Gender Equality and Equal Treatment Commissioner emphasised technical and

⁽¹¹⁾ <https://www.osale.ee/>

⁽¹²⁾ <http://eelnoud.valitsus.ee/main#b3pK62qB>

⁽¹³⁾ <https://rahvaalgatus.ee/about>

⁽¹⁴⁾ <https://riigikantselei.ee/en/good-practice-engagement>

⁽¹⁵⁾ <https://www.agri.ee/sites/default/files/content/arengukavad/biomajandus/2030/biomajanduse-strateegia-2030-ettepanek-eelnou.pdf>. NB: the term 'bio-economy' is not a synonym for the green or circular economy.

vocational education and training and retraining opportunities and measures in designing the strategy to guarantee equal opportunities for women ⁽¹⁶⁾.

In 2016 the Stockholm Environment Institute (SEI) and Estonian Women's Studies and Resource Centre (ENUT) organised a knowledge exchange event on gender wage gaps in bio-economy, specifically in the forestry and agricultural sectors. During the event various factors which are believed to influence the gender wage gap were discussed and proposals for additional research were made (e.g. to include the energy sector in the study). SEI also gave an overview about their gender wage gap study in the forestry and agricultural sectors, which highlighted that, although more women complete agricultural and forestry studies, they subsequently engage less in agricultural and forestry related employment. It also showed that the greater the share of women in employment the bigger the gender wage gap in the sector/field (Kirsimaa and Jürjes-Jürgens, 2016).

According to the Estonian Gender Equality and Equal Treatment Commissioner Office gender equality and equal opportunities for men and women in the green economy has received more attention in recent years but the approach could still be more systematic in taking into account gender issues. During the EU Structural Funds support period 2014-20 there are no specific measures for developing gender equality in the green economy.

⁽¹⁶⁾ Eesti biomajanduse strateegia aastani 2030 koostamise Ettepanek: <https://www.agri.ee/sites/default/files/content/arengukavad/biomajandus/2030/biomajanduse-strateegia-2030-ettepanek-eelnou.pdf>; Meeste ja naiste võrdõiguslikkuse aspekt Eesti biomajanduse strateegia 2015-2030 koostamise ettepanekus: http://www.vordoigusvolinik.ee/wp-content/uploads/2015/01/Soo-aspekt-Eesti-biomajanduse-strateegia-2015_2030.pdf

4. Skills development measures for the green economy

4.1. Skills needs identification and anticipation

Skills anticipation in Estonia does not have a long history and up to 2015 it was primarily based on the annual employment forecast conducted by the Ministry of Economic Affairs and Communications [Majandus- ja Kommunikatsiooniministeerium] ⁽¹⁷⁾. In recent years, however, Estonia has invested substantially in reforming its skills anticipation process, including the newly launched System of Labour Market Monitoring and Future Skills Forecasting [Oskuste Arendamise koordinatsioonisüsteem], OSKA) ⁽¹⁸⁾. OSKA produces data to supplement the Ministry of Economic Affairs and Communications' forecasts meaning that adjustments are made in these forecasts based on OSKA input ⁽¹⁹⁾. Additional information about the general skills anticipation system can be found in Skills Panorama ⁽²⁰⁾.

There is no occupation code or statistics collected specifically on green jobs in these annual forecasts. However, it is possible to discern, based on ISCO codes, some groups of occupations which can be linked with green economy and green jobs (e.g. 2133 – environmental protection specialists, 2143 – environmental engineers, etc.).

With the introduction of OSKA ⁽²¹⁾, sectoral forecasts are adjusted, as OSKA offers more insight about skills needed today and in the future, as well as about current mismatches. The implementation of this system has both increased the involvement of stakeholders and created a systematic process by which they can provide input into skills anticipation and give recommendations to upgrade competency standards. Thus, the role of private sector and social dialogue in the skills anticipation process is noticeable. Representatives from employers and trade unions sit on both the OSKA Coordination Council and the sector skills councils. Additionally, representatives of educational institutions influence the process through the OSKA Panel of Advisers. Finally yet importantly, the process places an emphasis on the input of sectoral experts' panels. Sectoral experts`

⁽¹⁷⁾ Analüüsid ja uuringud: <https://www.mkm.ee/et/analused-ja-uuringud>

⁽¹⁸⁾ OSKA. ESF programm: <http://oska.kutsekoda.ee/oskast/esf-programm/>

⁽¹⁹⁾ https://www.mkm.ee/sites/default/files/toojouproгноos_2024_lyhikirjeldus.pdf

⁽²⁰⁾ http://skillspanorama.cedefop.europa.eu/en/analytical_highlights/skills-anticipation-estonia

⁽²¹⁾ The OSKA programme is funded in part by a grant from the European Social Fund (ESF) and is implemented by the Ministry of Education and Research [Haridus- ja Teadusministeerium]. The Estonian Qualification Authority [Kutsekoda] is responsible for the daily administration of the programme. The Ministry of Economic Affairs and Communications, the Ministry of Social Affairs [Sotsiaalministeerium] and the Ministry of Finance [Rahandusministeerium] also contribute to the project, along with various representatives of other organisations. The OSKA project is part of the Estonian Lifelong Learning Strategy 2020 and is intended to fulfil the goal of harmonising learning opportunities with the demands of the labour market.

panels can give advice and suggestions regarding developments in the green economy. Green economy, green skills and green jobs are not explicitly part of the OSKA system but sectoral experts and other stakeholders can make recommendations on relevant changes stemming from the green economy, e.g. efficient use of resources, green transport, circular economy, etc., and needed revisions in the education level, technical and vocational training. As a result, the OSKA system enables the development of recommendations concerning curricula and training, bringing together employers, educational institutions and government authorities.

4.2. TVET provision for new green occupations and for greening established jobs and occupations

The Estonian Qualifications Authority [Kutsekoda] is responsible for the development of the occupational qualifications system and for coordinating the design and creation of occupational qualification standards (OQSs) for all economic sectors. The Estonian Qualifications Authority was established in 2001 in order to continue the work of the Estonian Chamber of Commerce and Industry in 1997. The Estonian Qualifications Authority was established in cooperation with the Estonian Chamber of Commerce and Industry, Estonian Employers' Confederation, Ministry of Social Affairs, Estonian Employees Unions' Confederation (TALO) and the Confederation of Estonian Trades Unions. In addition to the founders, the Supervisory Board of the Estonian Qualifications Authority includes a representative of the Ministry of Education and Research ⁽²²⁾.

In Estonia, there are no specific provisions or processes regarding the development of OQS particularly for green jobs or relevant to green occupations. Overall, for all occupations in the country, the main principles/criteria for the creation of OQS are the following ⁽²³⁾. The OQS needs to:

- (a) be based on job analysis or functional analysis;
- (b) describe expected competences in an observable and assessable way;
- (c) define the method(s) for assessing a persons' competence;
- (d) define the Estonian Qualifications Framework (EstQF) level of the respective occupational qualification.

The Sector Skills Council (SSC) decides on the need to develop or update the OQS based on the proposals of appropriate organisations (e.g. educational institutions, employer organisations) or persons. The preliminary application for the creation of a OQS may be proposed by (a) the awarder of occupational qualifications, (b) another organisation, enterprise or institution related with the field or (c) the Body of Chairperson of Sector Skills

⁽²²⁾ <http://www.kutsekoda.ee/en/kutsekoda>

⁽²³⁾ http://www.kutsekoda.ee/en/kutsesysteem/tutvustus/kutsestandardid_eng/principles

Councils. After the preliminary application has been approved a more thorough and amended proposal for designing the OQS is submitted (Kutsekoda, 2011).

Next, the Body of Chairperson of the Sector Skills Councils has to confirm the development of the OQS. The OQSs are designed by a working group, which is formed by the SSC. The working group includes various specialists, e.g. employers, managers, specialists from educational institutions and ministries, relevant stakeholder representatives (representing the sector) and trainers. After the preliminary draft for the OQS has been prepared, a survey is organised to gather feedback on the preliminary draft from the sector skills council members, sector employers and employees, education ministry representatives and educational institution representatives and trainers. The qualification standard is then accordingly amended and is finalised. Next, the SSC confirms the OQS and registers it in the database of occupational qualification standards [kutseregister]. The Estonian Qualification Authority [Kutsekoda] organises the work of working groups and the formation of qualification standards. In addition, it notifies educational institutions, curricula developers and other relevant stakeholders about confirmed changes (Kutsekoda, 2011).

The relevance and timeliness of OQSs are evaluated a year before the end of their expiration date. The evaluation takes into account changes in the general economic environment and in the specific economic sector (Kutsekoda, 2011). Again, suggestions may come from various stakeholders, including employers and educational institutions.

In Estonia, green jobs and green skills spread between different economic sectors and policy areas and there is no coherent training approach or framework. According to the Estonian Lifelong Strategy 2020, the results of OSKA analysis, projections and suggestions will form the basis for establishing qualifications and a career counselling service, for the curriculum development work of educational institutions, as well as for different authorities that finance learning activities. It is still too early to evaluate its implementation and what should be changed in the future, as the OSKA system has worked for only two years.

The institutional set up (regarding decisions on TVET provision on such skills) is linked to the skill needs anticipation system through OSKA Coordination Council and the Sectoral Experts Panels. These have deep insight into different sectors and can propose suggestions which may be addressed to very different stakeholders, e.g. training providers (e.g. the Estonian Unemployment Insurance Fund), curricula developers (e.g. in vocational and technical schools). Sectoral Expert Panels analyse and evaluate the need for different occupations in their sector for the next 10 years, as well as how well the education and training possibilities correspond to the needs of the labour market, what the current skills and knowledge level of workers is and the need for additional vocational and technical (re)training. Sectoral Expert Panels bring together the best experts from employers, schools and public authorities (more details in Section 4.1 and Annex 3).

As the Estonian Unemployment Insurance Fund [Eesti Töötukassa] also sits in the OSKA Panel of Advisers and in the Coordination Council, it can use the information and recommendations to design and upgrade training programmes and to offer relevant services

to the unemployed (although the Fund does not purposefully promote and develop green skills ⁽²⁴⁾) (Section 4.3).

Regarding the speed of upgrading of qualifications and competency standards, rapid changes in technological development necessitate frequent revision of professional standards ⁽²⁵⁾, (Table 2). Looking at sectors with close links to the green economy and green skills (Table 2), in 2017, there were many active changes and updates in the occupational qualifications standards in the architecture, geomatics, construction and real estate sector, several updates in the transport sector, relevant changes were also made in log house builder qualification standards and various engineer related occupations. In 2016 there were many updates in the automation engineering, energy, mining and chemical industry sector; several initial qualifications standards were confirmed in the engineering and manufacturing sector, as well (Table 2).

Table 2: Number of occupational qualification standards confirmed 2016-17

Sectors	2017 ⁽²⁶⁾		2016 ⁽²⁷⁾	
	Changes	Updates	Changes	Updates
Architecture, geomatics, construction and real estate	15	5	2	2
Energy, mining and chemical industry	-	4	3	8
Forestry	-	-	1	-
Engineering, manufacturing and processing	-	4	2	-
Food industry and agriculture	-	2	-	1
Transport and logistics	-	8	5	3

Source: The Estonian Qualification Authority.

In 2013 qualification standards for energy auditors, energy efficiency specialists and solar heating system installers, along with small scale wind turbine installers and technicians were amended. In addition, five initial qualification standards were specified for steelworkers, concrete workers and painters, and floor covering installers in the architecture and construction sector. The described competences included the need to know and consider the environment and environmental regulations. In 2012 a biogas-plant operator standard was confirmed in the energy sector, while in 2011 the qualification standard for biogas technology technician had been approved. Since 2010, based on observed changes in the OQSSs, the transport and logistics sector has been least influenced by green economy and sustainable development. Many changes have occurred in engineering, energy and construction-related

⁽²⁴⁾ Research conducted for this report did not reveal any information regarding specific activities, services or programs targeted to improving green skills or creating green jobs.

⁽²⁵⁾ Kutsekoda, OSKA sectors: <http://oska.kutsekoda.ee/en/oska-sectors/>

⁽²⁶⁾ http://kutsekoda.ee/et/kutsesysteem/kutsestandardid/uued_kutsestandardid/kutsestandardid_2017

⁽²⁷⁾ http://kutsekoda.ee/et/kutsesysteem/kutsestandardid/uued_kutsestandardid/kutsestandardid_2016

qualification standards; there have been fewer observable changes in the food industry and agriculture and forestry ⁽²⁸⁾.

The next section examines the suggested changes in skills in sectors related to the green economy that are of most importance in Estonia.

Agriculture

The main challenges in agriculture that require corresponding shifts in skills relate to automation, bio-fuel and bioenergy, biomass, organic farming, etc. In agriculture, environmentally sound methods are encouraged with various environmental support measures – e.g. support for environment-friendly management, for organic farming, etc. The creation of green jobs in agriculture and the greening of agriculture are associated with skills that are characterised by cost-efficiency and rational choices, environmental and soil friendliness (Värnik et al., 2012).

Forestry

Employment in forestry and wood industries is expected to grow slightly in the future (Lambing et al., 2016). The increased use of machinery has reduced significantly the number of unskilled workers in forestry and increased the need for skilled and specialist workers. The goals of greening forestry relate to environmental care, recycling of waste and energy efficiency in production. Forestry workers are therefore required to have additional knowledge in chemistry, biochemistry, economics of engineering, product and technology development – these developments should be taken into account in designing curricula. New green jobs in forestry are considered those where various skills are combined together in a different, more interdisciplinary way (Värnik et al., 2012). The Forestry Strategy for 2011-20 emphasises under the measure 'to guarantee the existence of qualified, well-prepared and adaptable work force' the need to increase the number of skilled workers e.g. harvester and forwarder operators, woodworkers, etc. in preliminary, vocational and technical and additional training ⁽²⁹⁾. According to the recent skills forecast for the forestry sector, about three quarters of the workforce should be provided with vocational education and a quarter with higher education (Kitt and Leoma, 2016). However, industry partners claim that first level university studies are too theoretical and do not provide sufficient practical skills. The need to provide a more holistic understanding of the role of forestry and wood industry is also emphasised. Thereby the curricula should provide better knowledge in economics, entrepreneurship and forest management (Kitt and Leoma, 2016).

⁽²⁸⁾ http://www.kutsekoda.ee/et/kutsesysteem/kutsestandardid/uued_kutsestandardid

⁽²⁹⁾ Eesti Metsanduse Arengukava aastani 2020:
http://www.envir.ee/sites/default/files/elfinder/article_files/mak2020vastuvoetud.pdf

Construction

Regarding construction, emphasis is placed on energy efficiency, environmental care and the impact on people's health. Thus, it is argued that construction curricula should include more courses of environmental impact evaluation, energy certification, environmental management systems and sustainable construction. Relevant knowledge and skills are pertinent to all occupations involved: greening in the construction sector should start from the architect or the designer who is responsible for designing the construction/building. As the architect/designer has the ability to advise its customers which materials and technologies to use, they should have an expert knowledge in these areas as well as about environmental impacts (Värnik et al., 2012).

The Renewable Energy Implementation Plan includes activities such as the construction of example low energy houses. During the construction process, construction specialists are been trained about how to build low energy houses, what kinds of materials are used, etc., thereby exploring and increasing the possibilities for, and share of, renewable energy in construction (Majandus- ja kommunikatsiooniministeerium, n.d. b). Another activity described in the 'Climate Change Adaption Development Plan until 2030' emphasises the need to increase the competence of construction workers in climate change adaptation.

Transport

The biggest challenges in transportation in Estonia relate to heavy car use, slow improvements in the energy efficiency of the vehicle fleet, rapid growth of road transportation and decline in rail transportation, urban sprawl, and declines in the share of public transport and non-motorised traffic (Värnik et al., 2012). The corresponding skills requirements are most of all related to the use of environmentally friendly technologies and procurements – it is suggested that the public sector might take a driving seat here by demanding the use of sustainable, green technologies and preferring them in procurement (Värnik et al., 2012).

Energy sector

The demand for specialists and skilled workers will be most influenced by the production volume of oil shale and the share of retired workers (Keskkonnaministeerium, 2014). As noted earlier, over the past ten years the number of specialists in the energy sector has increased and the number of skilled workers has decreased (Lambing et al., 2016). In terms of labour forecasts, there is also a growing need for engineers and technicians, and a diminishing need for unskilled workers. The sector needs new recruits to replace retired workers as 40% of workers in basic occupations are currently aged 50 or older. The growth rate of mining, heat energy, gas and electricity engineers are considered inadequate, given that the number of applicants for energetics and mining specialization has halted in higher education (Sõmer and Rosenblad, 2017). Thus, it is argued that it is also essential that

current experienced professional engineers are motivated to acquire the necessary up-to-date professional knowledge and skills pertinent to the sector ⁽³⁰⁾.

Although there is a decreasing trend in the production of oil shale, the need for specialists with relevant training will not diminish, because new jobs are expected to be created with the introduction of new minerals in the future. The need for labour in oil shale energy is shifting from oil shale mining to oil shale chemistry production, while employment is also increasing in renewable energy (Sõmer and Rosenblad, 2017). The 'Development Plan for the Use of Oil Shale 2016-30' (Keskkonnaministeerium, 2015) describes that both oil shale enterprises, Eesti Energia and VKG, will increase their production and thus create new jobs in the production industry and in related service areas, e.g. logistics and construction.

To maintain the sustainable and efficient use of oil shale, it is necessary to train skilled and top-level specialists with good knowledge in oil shale mining and production, technologies and its environmental impact ⁽³¹⁾. In addition to specialist skills, employees must have good general skills – communication, management and collaboration skills, and be able to 'see the whole picture'. Skills in IT (given the ongoing trend towards automation) and cyber security are also vital for energetics and mining staff (Sõmer and Rosenblad, 2017). New equipment in the sector is expected to require fewer but more qualified employees (Lambing et al., 2016).

Another topic, closely related to energy sector, where the need for highly qualified specialists is emphasised is the maintenance (collection and processing) of equipment containing substances that deplete the ozone layer. Thus, among the lines of action is improvement of the qualification of personnel dealing with ozone-depleting substances (Ministry of the Environment, 2007).

Environmental education

The role of environmental education is emphasised in several strategy documents (including Sustainable Estonia 21 and the Estonian Lifelong Strategy 2020, as well as in the Forestry Strategy for 2011-20 and in the recently adopted resolution by the parliament [Riigikogu] General Principles of Climate Policy until 2050. Reasonable management of natural resources assumes an integrated development of technical and so-called ecological education, which has to form an organic part of education at all levels of study, starting from kindergarten to higher education studies. According to the aforementioned strategic documents, the balanced sustainable development of Estonia is dependent on promoting the natural-scientific, ecological, green, etc. - way of thinking in society.

Which skills will be needed in the future for green jobs?

Green energy and technology development require people who have knowledge in science, e.g. engineers. On the other hand, it is also essential to teach economics and

⁽³⁰⁾ Sustainable Estonia 21.

⁽³¹⁾ Development Plan for the Use of Oil Shale 2016-30.

entrepreneurship - practical things - to mathematicians and physicists to enhance their chances of finding a job in different sectors (Pärna, 2016).

Regarding sustainable and green thinking and green economy related skills and attitudes, knowledge about how to reduce the exploitation of non-renewable resources, increase the availability of clean drinking water, increase efficiency in production, reduce the ecological footprint of products, how to manage and plan complex ecological and technological processes will gain importance. To sum up, green economy creates jobs at different competence and management levels and for varying levels of skills (Pärna, 2016).

4.3. ALMPs and retraining measures

The Estonian Unemployment Insurance Fund [Eesti Töötukassa] does not actively engage and support specifically the green economy and green jobs nor has there been a need to define green skills and green jobs and to collect and analyse relevant data. On the other hand, if OSKA analysis reports increasing demand for these skills and jobs then the employment service providers offer the necessary training and design relevant services. The role of private employment service providers particularly for offering trainings to the unemployed on green skills is not visible: although larger private employment service providers in Estonia do offer various training possibilities (smaller ones do not) no information could be found about specific training on increasing green skills.

Since the 1st of May 2017, the Estonian Unemployment Insurance Fund has offered additional services, which are designed to prevent unemployment. These services are targeted to employees who need support in changing jobs or remaining employed due to a lack of skills or their skills being outdated (these may include green skills but are not specifically designed for green skills), as well as to employers to support them in finding and training suitably skilled workers and restructuring their companies ⁽³²⁾.

The new employment services are as follows:

- (a) a degree study allowance for an employed person or a person registered as unemployed for obtaining vocational, professional higher education or bachelor's studies;
- (b) labour market training with a training card for employed persons at risk of unemployment;
- (c) support for obtaining qualifications for employed persons who have undergone labour market or other training with the support of the training benefit (meaning costs related to the acquiring of formal qualifications are compensated for the employed person);
- (d) a training grant for employers for improving the skills and knowledge of their employees upon their recruitment and helping them to adapt to changes in the employer's economic activities.

⁽³²⁾ Eesti Töötukassa, Work and Study: <https://www.tootukassa.ee/eng/content/work-and-study>

The detailed list of vulnerable groups can be found in Annex 4. In short, according to the labour market services and support law the following population groups are considered as vulnerable (risk) groups: young people and the elderly but also people who lack sufficient Estonian language skills; also, disabled people and the long-term unemployed make up important target groups to whom employment services are provided.

As expected, these groups need (re)training the most to keep them engaged, motivated and active in the labour market. The last occupation held by the registered unemployed is most often service and sales and elementary jobs among the younger population, and elementary jobs and craft and related trades among older people, construction also being common ⁽³³⁾.

The Estonian Unemployment Insurance Fund offers a variety of services to unemployed people from (re)training to work practice and from counselling to mobility benefits. There are special services for:

- (a) disabled people (e.g. assistance at job interviews, adjustment of workspaces and working environment, working with a support person, provision of advice and training for employers, etc.);
- (b) for individuals with decreased working ability (e.g. work placement, voluntary work, business start-up subsidies);
- (c) for jobseekers of retirement age (e.g. training, support for obtaining qualifications, business start-up subsidies, work placement, business support, adjustments in workspaces and environment, lending (free of charge) of the assistive equipment needed to carry out work);
- (d) for young people of age 17-29 (e.g. wage subsidies for the employer, compensation of training costs) and for the long-term unemployed (e.g. work practice).

In general employers in Estonia can apply funding from the public sector for investments but there is no information about a specific support or scheme (e.g. training) for developing green skills among employees or creating green jobs. Nevertheless, the Estonian Unemployment Insurance Fund [Eesti Töötukassa] offers a variety of services, including training and retraining possibilities, which may be for the unemployed or conducted by employers for their workforces. In 2017 about 3 million and in 2018 up to EUR 15 million will be invested in workers' skills development ⁽³⁴⁾; thus skills development in Estonia has been a high priority.

In 2016-17 the Estonian Unemployment Insurance Fund in cooperation with the Social Ministry introduced a training grant for employers for improving the skills and knowledge of their employees upon their recruitment in areas and sectors that are characterised by labour

⁽³³⁾ Eesti Töötukassa. Peamised statistilised näitajad:
<https://www.tootukassa.ee/content/tootukassast/peamised-statistilised-naitajad>

⁽³⁴⁾ Eesti Töötukassa. Töötukassalt töötajale – uued võimalused oskuste täiendamiseks:
<https://www.tootukassa.ee/uudised/tootukassalt-tootajale-uued-voimalused-oskuste-taiendamiseks>

shortage (based on the OSKA system and recommendations) and helping them to adapt to changes e.g. in the employer's economic activities, in the technologies or in the required qualifications. This training grant is available to employers in situations when the desired training requires additional costs from the employer and lasts at least 10 days (80 hours). The employer can choose the appropriate training, e.g. occupational skills or general skills training. If there is no suitable training then the employer together with educational institutions can design the curricula and training. The maximum amount of training grant provided to employers is EUR 1 250 (50% of the training cost) and with vulnerable (risk) groups workers it may reach EUR 2 000 (80% of the training cost) ⁽³⁵⁾. As the described measure is relatively new, it is difficult to evaluate its success. Nevertheless, the key elements of success seem to be that the government values and prioritises the development of skills and has provided the necessary support to prevent people becoming unemployed. Furthermore, the training decisions are linked with the OSKA skills anticipation system, while employers are actively involved in skills anticipation (the OSKA system and bodies) and development (training, curricula) process.

Experts stress that the Fund did not collect data on green economy, green skills and jobs due to policy makers' lack of interest in such data. It is argued that classification on green data should be developed taking into consideration the information needs of ministries and Statistics Estonia. Thus, the Fund does not collect data regarding the participation rates of various groups of employees in retraining and other ALMP measures focusing explicitly on green skills and green occupations.

4.4. The role of the private sector in skills training

Employers are actively involved in identifying, designing and developing relevant skills training, retraining and in-service training. This is possible through cooperation with the Estonian Unemployment Insurance Fund and the OSKA system. Currently, there are no special incentives offered to employers to provide training specifically on green skills, since the OSKA system that feeds skills information to training decisions does not identify green skills as a separate development or priority field. Also, as described before (Section 4.1 and Annex 3), the OSKA system and approach is sector-specific and potential green skills and jobs are spread between different economic sectors. Individual economic sectors and policy areas have their own development and implementation plans that may include some measures (financial support) or activities (training) targeted to training in some field of occupation or field of activity (Section 4.1 for examples).

Overall, there is no specific measure or funding scheme in Estonia for training employees on green skills. Enterprise Estonia [EAS – Ettevõtluse Arendamise Sihtasutus,

⁽³⁵⁾ Eesti Töötukassa. Töötukassalt töötajale – uued võimalused oskuste täiendamiseks: <https://www.tootukassa.ee/uudised/tootukassalt-tootajale-uued-voimalused-oskuste-taiendamiseks>

and the Environmental Investment Centre [KIK – Keskkonnainvesteeringute Keskus] have funded projects in sectors aimed at increasing awareness on sustainable development and environmental care and management; and at greening the work environment. For example, the EAS supported the introduction of environmental management systems in enterprises in tourism; it also supported sustainable and environmental friendly product development in some sectors through the use of information and communication technologies (so called Green IT).

In 2017, the Ministry of the Environment in cooperation with Tallinn University of Technology and the enterprise ÄF-Consulting organised specific training for experienced engineers and specialists in the field of energy and resource management. This was the first training offered under the measure for increasing the resource-efficiency of enterprises ⁽³⁶⁾ and for educating specialists who after completing the training are able to perform analyses regarding the use of resources in an industrial enterprise. There will be another training session in the autumn of 2017 ⁽³⁷⁾.

4.5. The role of the institutional set up

Currently, there are no bodies or committees in place that focus specifically on the topic of green economy, jobs or skills. Until 2016, the Estonian Development Fund [Arengufond], a public institution whose aim was to support the development of the Estonian economy, focused on the green economy and the efficient use of resources ⁽³⁸⁾. In 2017, the Estonian Development Fund has ceased its operation and the activities moved under the Foresight Centre under the Chancellery of Estonian Parliament ⁽³⁹⁾. However, green skills and green jobs are not explicitly recognised as focal point for the work of the Foresight Centre; although under the general theme ‘future work and work relationships’ there may be some room for green jobs.

On the other hand, there are organisations and committees that focus on sustainable development. The Strategy Unit of the Government Office [Riigikantselei strateegiabüroo] coordinates topics related to sustainable development, competitiveness and reporting. Advisory functions are performed by the Commission for Sustainable Development [Säästva Arengu Komisjon] and the inter-ministerial working group for sustainable development ⁽⁴⁰⁾.

The Commission for Sustainable Development is comprised of the most important non-governmental organisations and their representatives. There are 19 non-governmental

⁽³⁶⁾ Support measure Corporate energy and resource efficiency: <http://ressurss.envir.ee/>

⁽³⁷⁾ Energia- ja ressursijuhtimise alased koolitused: <http://www.envir.ee/et/energia-ja-ressursijuhtimise-alased-koolitused>

⁽³⁸⁾ Eesti Arengufond. Green economy: <http://www.arengufond.ee/en/green-economy/greeneconomy/>

⁽³⁹⁾ Foresight Centre: <https://www.riigikogu.ee/en/foresight/>

⁽⁴⁰⁾ Riigikantselei. Säästev areng: <https://riigikantselei.ee/et/saastev-areng>

organisations represented such as the Estonian Trade Union Confederation, Estonian Chambers of Commerce and Industry, Estonian Forest Society, Estonian Chamber of Agriculture and Commerce, Estonian Association for Environmental Management, Estonian Council of Environmental Non-Governmental Organisations, etc. The members of the commission elect their management for two years.

The inter-ministerial working group for sustainable development is headed by the Strategy Director. The members of the working group are representatives of ministries concerned with the implementation of Sustainable Estonia 21 (the Ministry of the Environment, the Ministry of Economic Affairs and Communications, the Ministry of Agriculture, the Ministry of Social Affairs, the Ministry of Education and Research, the Ministry of Culture, the Ministry of Finance, the Ministry of the Interior, the Ministry of Justice) at the level of deputy secretary generals and heads of department, as well as representatives of Statistics Estonia. The task of the working group is to coordinate and monitor the implementation of Sustainable Estonia 21 and to organise information and best practices exchange in the field of sustainable development ⁽⁴¹⁾.

To conclude, there is no organisation specifically concerned with green skills, green jobs or the green economy. These are covered by bodies with broader focus, such as committees that focus on sustainable development. The lack of such a specific institutional set up can be explained by the fragmented and sector/area-specific approach that exists in the government structure of the country. Each sector is mostly interested in its own activities and developments and there is no broad vision for the green economy and green skills. As analysed in previous sections, the OSKA skills anticipation system inherently takes into account developments in the green economy and sustainable development through the advice and knowledge of sectoral experts.

⁽⁴¹⁾ Riigikantselei. Säästev areng: <https://riigikantselei.ee/et/saastev-areng>

5. Conclusions and recommendations

Green jobs and green skills are currently most evident in agriculture, forestry and industry, but also in waste and the circular economy, renewable energy economy, transport (including public transport), hand-made and recycled crafts and design and also in the education sector (e.g. nature, biology teachers, scientists, etc.). There is no comprehensive approach to green skills development, as different economic sectors have their own priorities and challenges: strategic development and implementation plans may include measures where under some activities training can be found; nonetheless, there is no comprehensive approach to the provision of systematic green skills training in these economic sectors. All measures have been rather ad hoc.

Coherence between skills development policies and environmental policies and climate change policies is still a challenge due to the lack of comprehensive and systematic linkages (e.g. goals, activities, measures). Cooperation between social and environmental ministry officials and stakeholders could fill this gap.

As there is no unified approach among stakeholders of what classifies a green job and whether it is possible to define green skills as a separate competence, green skills and jobs are heterogeneously spread between economic sectors. Adopting a clear approach on green jobs and skills in the national context would allow for a more comprehensive mapping and assessment of all the relevant measures in place; thus fostering targeted social dialogue and experts' suggestions regarding relevant improvements.

Although lack of a specific institutional set up on green skills may give the impression that this hinders the systematic development of relevant measures and initiatives, the skills anticipation activities in Estonia are all directly related to the newly launched OSKA system. The OSKA system has a comprehensive approach to skills development: inherently it takes into account developments in the green economy and sustainable development through the advice and knowledge of sectoral experts. It is highly unlikely that an alternative mechanism will be created for specifically green skills development. Thus, most probably, it is essential to find ways to make green jobs and skills more visible in the OSKA system. Cooperation between the public and private sector would greatly promote this goal.

The OSKA system could function as a platform for the development of a common vision on green skills and jobs through the engagement of all relevant stakeholders. This would foster linkages between environmental and labour policies and skills development, as both policy makers and practitioners are involved.

List of abbreviations

ALMP	Active Labour Market Policy
Cedefop	European Centre for the Development of Vocational Training
EAS	Enterprise Estonia [Ettevõtluse Arendamise Sihtasutus]
EIS	Eelnõude Infosüsteem Work environment/platform
ENUT	Estonian Women's Studies and Resource Centre
EstQF	Estonian Qualifications Framework
EU	European Union
GDP	Gross Domestic Product
ILO	International Labour Organization
KIK	Environmental Investment Centre [Keskonnainvesteeringute Keskus]
OQSs	Occupational Qualification Standards
OSKA	System of Labour Market Monitoring and Future Skills Forecasting
SEI	Stockholm Environment Institute
SSC	Sector Skills Council
TALO	Estonian Employees Unions' Confederation
TVET	Technical Vocational Education and Training
VKG	Viru Keemia Grupp [the largest manufacturer of shale oil and chemicals in Estonia and Europe]

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ANNEX 1.

Key challenges and changes in the economic environment

In the near future, labour shortages are expected in the Estonian labour market. Consequently, there will be pressure on finding ways to improve productivity and to increase the added value of products-services; while keeping up with the goals of sustainable development. Thus, increasing general awareness on environmental friendly production and consumption will be of great importance as this may further boost demand for such products and services.

The main challenges that have affected Estonia and its labour market after 2009-10 and are expected to continue challenging the society are primarily related to social changes and labour shortages:

- (a) aging population and decline in the number of working-age population: in 2017, 19% of the population are 65 years old and older. In ten years, their share has grown 2.1%. When in the 1990s, pension-aged people constituted 12% of the population, by 2017 there are more than a quarter more of them. The number and share of older people is expected to increase, also augmented by the low birth rate. In ten years, the working-age population has decreased by 63 000 persons, which means an average decline of 6 300 persons a year ⁽⁴²⁾;
- (b) mobile population: in 2004, roughly 3 000 Estonians moved out of the country. In 2013, nearly 7 000 decided to emigrate; in 2014, the number declined to 4 600 ⁽⁴³⁾. These numbers reflect only the official statistics; in reality the number of Estonians living abroad is estimated to be considerably higher. Since citizens have no obligation to report their migration status to the state, the precise number of Estonians who have left the country, either temporarily or permanently is unknown. According to a rough estimation by the Ministry of Education and Research, about 20% of Estonians (~200 000) live and work abroad ⁽⁴⁴⁾;
- (c) the changing nature of work and the increasing role of automation (Pärna, 2016): some jobs will disappear and some new jobs will be created. Whether these new jobs value environment and sustainable development or not will again depend on consumer preferences and regulations both at the EU and national level;
- (d) heterogeneous labour force and changing attitudes towards work: the share and influence of the so called X, Y and Z generations in the labour market have become

⁽⁴²⁾ Statistics Estonia. Quarterly Bulletin of Statistics Estonia 2.2017: https://www.stat.ee/publication-2017_quarterly-bulletin-of-statistics-estonia-2-17

⁽⁴³⁾ Statistics Estonia, migration: https://www.stat.ee/sab-uuendus?db_update_id=16312

⁽⁴⁴⁾ Ministry of Education and Research. Eestlased välismaal: <https://www.hm.ee/et/tegevused/eesti-keel-ja-voorkeeled/eestlased-valismaal>

evident. Different attitudes and aspirations among these generations are mirrored in their diverse expectations on the organisation of work, the motivation to work, employer-employee relationship, etc. (Pärna, 2016).

Secondly, major changes in environment relevant policies have taken place:

- (a) environmental and ecological taxes: The taxation of environmental pressure has been raised steadily: for example, fuel excise duty rates have been raised considerably and environmental charges have increased on an annual basis. Nevertheless, increased taxation has not brought along a transition to a more resource efficient and less polluting economy ⁽⁴⁵⁾;
- (b) in 2017, the Estonian parliament [Riigikogu] confirmed the resolution 'General Principles of Climate Policy until 2050' that sets the vision for the country to be, in 2050, a competitive economy with low carbon dioxide emissions (specific targets are set in the resolution). The resolution includes sectoral policy guidelines for energy and industry, transport, agriculture and forestry and land use (Estonian Parliament, 2017). This document emphasises, that knowledge, skills and attitudes related to climate change will be more thoroughly addressed at all education levels, while relevant training will be supported for non-formal environmental education;
- (c) in 2017, the government [valitsus] approved the development and implementation plan on 'Climate change adaption development plan until 2030' (Keskkonnaministeerium, n.d.);
- (d) in 2016 Estonia ratified the Paris Agreement on climate change ⁽⁴⁶⁾;
- (e) the Ministry of Economic Affairs and Communications has started the development of a new development plan for the energy sector that aims to ensure an energy supply that is available to consumers at a reasonable price and effort and with an acceptable environmental condition ⁽⁴⁷⁾. Areas such as the diversification of energy supply, increasing the share of renewable energy and integrating IT development and possibilities (at the same time maintaining cyber security) into energy economy are of vital importance;
- (f) in 2017, changes in the forestry legislation were approved, focusing on the sustainable and diversified development of Estonian forests ⁽⁴⁸⁾.

Thirdly, changes in entrepreneurial and business environment:

⁽⁴⁵⁾ Statistics Estonia. Quarterly Bulletin of Statistics Estonia 2.2017: https://www.stat.ee/publication-2017_quarterly-bulletin-of-statistics-estonia-2-17

⁽⁴⁶⁾ Keskkonnaministeerium. Pariisi kokkulepe: <http://www.envir.ee/et/eesmargid-tegevused/kliima/pariisi-kokkulepe>

⁽⁴⁷⁾ Estonian National Development Plan of the Energy Sector Until 2030: <https://www.mkm.ee/et/arengukavad>

⁽⁴⁸⁾ Keskkonnaministeerium. Metsaseaduse muutmise seaduse väljatöötamine: <http://www.envir.ee/et/eesmargid-tegevused/metsandus/metsaseaduse-muutmise-seaduse-valjatootamine>

- (a) the economic recession diminished the low-cost advantage of the national economy. To recover from the recession businesses had to find ways to improve their productivity, export possibilities and increase the added value of their products-services to move up in the value chain. To maintain their competitiveness, some employers lowered wages of and benefits for the workers, others retargeted their activities (e.g. markets, products);
- (b) there is more emphasis on increasing productivity and creating products-services with higher added value. The Estonian Entrepreneurship Growth Strategy 2014-20 and the competitiveness plan 'Estonia 2020' both pursue the goal to increase productivity per employed person to 80% of the EU average. Research and development activities, innovation and investments and export are therefore of vital importance;
- (c) there are various and developing measures for enhancing export activities and entrepreneurship, e.g. export consultation services, export training activities, networking, export seminars, etc.;
- (d) the business and economic environment is strongly influenced by changes in world energy prices, low Euribor and the low cost of borrowing and various support schemes and measures from the EU structural funds.

ANNEX 2.

Key policies, strategic documents and regulations

The Ministry of Social Affairs has designed a 'Welfare Development Plan for 2016-23' (Sotsiaalministeerium, n.d.) that assigns significant role to the OSKA system regarding identifying skills needs in the labour market and consequently, in supporting high employment rates and a high quality working life.

Another strategy, 'The Estonian Entrepreneurship Growth Strategy 2014-20' contributes to 'Sustainable Estonia 21' and links to 'Estonia 2020'. The strategy emphasises active labour market policies so to increase the supply of skilled workers and employment. The main aim of the strategy is to increase the productivity of Estonian entrepreneurs to a level that is equivalent to 80 per cent of the respective average of the EU. The strategy emphasises entrepreneurial knowledge, skills and attitudes as well as general management skills. It also stresses the constant need for engineering and technical competence and states that the output of the education system should correspond better to the needs of enterprises. The strategy also addresses the principles of environmentally friendly economy and defines a more efficient use of resources as one of three key areas for smart specialisation in Estonia. However, no specific reference is made for green skills.

The principles of 'Sustainable Estonia 21' are made more explicit in the 'Estonian Environmental Strategy 2030', which defines sector-specific development plans related to environmental issues. The Environmental Strategy specifies long-term goals in the areas of reduction of waste, disused hazardous sites and the pollution load; sustainable use of water and mineral resources; energy, transport, forestry, fisheries and hunting; and preservation of the diversity of nature and landscapes. The strategy underlines that the government will effectively support technology development and research regarding the adaptation of more environmentally friendly solutions. It also declares that environmental education should be integrated in all curricula of higher education. In general, green transport, green technologies and efficient use of resources and green energy are mentioned. This strategy also links to the 'Estonian Renewable Energy Action Plan until 2020' (Majandus- ja kommunikatsiooniministeerium, n.d. b). which in turn includes the 'Estonian Development Plan for the Electricity Sector 2018' (Majandus- ja kommunikatsiooniministeerium, n.d. a) and the 'Development Plan for the Use of Oil Shale 2016-30'.

In 2017, the government [valitsus] approved the development and implementation of the 'Climate Change Adaption Development Plan until 2030'. Under the priority area 'Society, awareness and cooperation' there is a reference, that when extreme weather conditions become more common, the need for social workers will increase as vulnerable population groups will need appropriate assistance. There is one measure, which targets central and local government workers (e.g. social workers) to increase their knowledge on climate change. Another measure targets education institutions to support them in integrating climate change into their curricula. Under the priority area 'Land use and planning' a reference is made to the need to train planning experts with knowledge of climate change and adaptation.

Currently, the Ministry of Economic Affairs and Communications has started the development of the 'Estonian National Development Plan of the Energy Sector Until 2030' ⁽⁴⁹⁾. The plan aims at ensuring energy supply available to consumers at a reasonable price, while observing the terms and conditions established in the long-term energy and climate policy of the EU. The new plan also drafts the benchmarks for renewable energy and energy efficiency operational programmes and the vision for the renovation of buildings. The proposal for the new development plan includes a measure for safeguarding the energy supply in electricity, heat, domestic fuel and transport economic sectors, etc. The need to develop workers' knowledge and provide additional training is emphasised due to frequent changes in the energy economy.

The central aim of the 'Estonia Renewable Energy Action Plan until 2020' is the accelerated utilisation of renewable energy sources for energy production. Support measures are also provided, e.g. for using sources of bio-energy. The goals of the 'Development Plan for the Use of Oil Shale 2016-30' are specifically related to more efficient and sustainable use of oil shale; however, the skills requirements and skills development are not touched upon. Also, it is highlighted that to maintain the sustainable use of oil shale, it is necessary to train skilled and top-level specialists with good knowledge in oil shale mining, use, technologies and environmental impact.

A framework document that describes Estonia's EU policy and sets the main principles for meeting its objectives in the EU – 'Estonia's European Union Policy 2015-19' – also has several connections with the green economy. Due to the heavy use of oil shale in Estonia and the corresponding emissions, great attention is on fostering the use of various sources of renewable energy and increasing the efficiency of existing oil shale technologies. The document also addresses principles of education, training and lifelong learning as the central policies for developing human capital and creating favourable conditions for future growth (Vabariigi valitsus, n.d.).

In 2016, the relevance and timeliness of the strategy Sustainable Estonia 21 was analysed (Sepp et al, 2016). The relevant report gathered proposals for renewing the system of indicators for sustainable development in the country. The research team proposed an indicator under the goal 'viability of the Estonian cultural space' and the goal component 'the quality of human resource' which would measure the quality and coverage of sustainable development and environmental. In this context, sustainable development regards a wide variety of societal and environmental topics (e.g. the openness of the cultural space; the functionality of Estonian culture; the quality of human resources; economic wellbeing; preservation of the population; safety; health; the quality of the living environment; good governance; engaging society; climate and energy; the vitality of ecosystems, the environmental impact of consumption and production, etc.). The proposals however did not refer specifically to green skills or green jobs.

⁽⁴⁹⁾ <https://www.mkm.ee/et/arengukavad>

ANNEX 3.

Skills development measures and skills needs identification/anticipation

Skills anticipation in Estonia does not have a long history and up to 2015 it was primarily based on the annual employment forecast conducted by the Ministry of Economic Affairs and Communications [Majandus- ja Kommunikatsiooniministeerium] ⁽⁵⁰⁾. In recent years, however, Estonia has invested substantially in reforming its skills anticipation process, including the newly launched System of Labour Market Monitoring and Future Skills Forecasting [Oskuste Arendamise koordineerimisüsteem, OSKA] ⁽⁵¹⁾. OSKA produces data to supplement the Ministry of Economic Affairs and Communications' forecasts; thus, these forecasts are adjusted based on OSKA input (Majandus- ja Kommunikatsiooniministeerium, 2016).

Currently, the following authorities are to some extent responsible for the administration of skills anticipation activity:

- (a) the Estonian Qualification Authority;
- (b) the Ministry of Economic Affairs and Communications;
- (c) the Ministry of Social Affairs;
- (d) the Ministry of Education and Research;
- (e) the Ministry of Finance.

The OSKA Coordination Council is comprised of representatives from the four ministries and various stakeholder organisations, e.g. representatives from employers and trade unions and Estonian Unemployment Insurance Fund [Eesti Töötukassa]. Its role is:

- (a) to select sectors to be studied each year;
- (b) commission new analysis and/or research;
- (c) approve the results of sectoral reports;
- (d) submit an overview of skills needs to the government;
- (e) make recommendations to other governmental bodies or institutions on how to best meet the skills needs of the labour market;
- (f) to prioritise among sectors and occupational groups.

The OSKA Panel of Advisors contributes to the development of the OSKA methodology and to preparing the decisions of the Coordination Council. It has the task of being a partner and advisor to the Estonian Qualifications Authority. The Panel includes the best experts in the labour market and education fields from Estonian universities, research companies, etc. The task of the Sectoral Expert Panels is to prepare forecasts of labour requirements and

⁽⁵⁰⁾ Majandus- ja kommunikatsiooniministeerium. Analüüsid ja uuringud. Tööjõuprognosisid: <https://www.mkm.ee/et/analused-ja-uuringud>

⁽⁵¹⁾ Kutsekoda. OSKA. ESF programm: <http://oska.kutsekoda.ee/oskast/esf-programmi/>

skills in OSKA sectors and it brings together the best experts from among job creators, schools and public authorities. In general, the Sectoral Expert Panels have a deep insight into each sector and propose suggestions, which may be addressed to a wide range of stakeholders, e.g. training providers, curricula developers⁽⁵²⁾. This means that sectoral experts can give advice and suggestions regarding developments in the green economy. Green economy, green skills and green jobs are not explicitly part of the OSKA system but sectoral experts and other stakeholders can make recommendations on relevant changes stemming from the green economy, e.g. efficient use of resources, green transport, circular economy, etc.

The implementation of this system has both increased the involvement of stakeholders and created a systematic process by which they can provide input into skills anticipation. Representatives from employers and trade unions have seats on both the OSKA Coordination Council and the sector skills councils. Representatives of educational institutions also have a sizeable role in the process. Additionally, the process places an emphasis on the input of sectoral experts. As a result, OSKA enables recommendations on curricula and training, bringing together employers and educators.

⁽⁵²⁾ OSKA management. OSKA coordination council: <http://oska.kutsekoda.ee/en/oska-management-methodology/oska-management/>

ANNEX 4.

Vulnerable (risk) groups identified by the Estonian Unemployment Insurance Fund

According to the labour market services and support law the following population groups are considered as vulnerable (risk) groups:

- (a) unemployed persons of 55 years up to the pensionable age (elderly);
- (b) unemployed persons of 16 up to 24 years of age (young people);
- (c) unemployed persons who are not proficient in Estonian and whose employment is thus difficult;
- (d) unemployed persons who, prior to registration as unemployed, have received a caregiver's allowance pursuant to paragraph 8 of the Social Benefits for Disabled Persons Act ⁽⁵³⁾ and who have not been employed or engaged in an activity equal to work during the twelve months prior to registration as unemployed; unemployed persons who, prior to registration as unemployed, have received a caregiver's allowance pursuant to paragraph 23(2) of the Social Welfare Act ⁽⁵⁴⁾ and who have not been employed or engaged in an activity equal to work during the twelve months prior to registration as unemployed;
- (e) long-term unemployed who, for at least twelve months, have not engaged in the work or in an activity equal to work. A young person of 16 up to 24 years of age is deemed to be a long-term unemployed if he or she, for at least six months, has not engaged in the work or in an activity equal to work;
- (f) unemployed persons with disabilities who thus need additional support upon commencing employment;
- (g) unemployed persons released from prison within the twelve months preceding registration as unemployed;
- (h) unemployed persons whose possibility to find employment is particularly hindered (entry into force 01.05.2011).

⁽⁵³⁾ Riigi Teataja. Social benefits for disabled persons act.
<https://www.riigiteataja.ee/en/eli/509012015003/consolide>

⁽⁵⁴⁾ Riigi Teataja. Social welfare act. <https://www.riigiteataja.ee/en/eli/504042016001/consolide>