Green Skills Roadmap Flanders

Best Practices Report

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Trinomics

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List of acronyms and abbreviations

3D	Three dimensional
Afpa	*Agence nationale pour la formation professionnelle des adultes* – National Association for Vocational Training
AM	Additive Manufacturing
BAVC	*Bundesarbeitgeberverband Chemie* (Federation of Chemical Employers' Associations)
BIBB	*Bundesinstitut für Berufsbildung* (Federal Institute for Vocational Learning)
CE	Circular Economy
CEO	Chief Executive Officer
CSR	Corporate Social Responsibility
CVET	Continuing Vocational Education and Training
DWSE	(Flemish) Department of Work and Social Economy
EGD	European Green Deal
EQF	European Qualifications Framework
ESF	European Social Funds
EU	European Union
HEI	Higher Education Institutions
IG BCE	*Industriegewerkschaft Bergbau, Chemie, Energie* (Trade Union for mining, chemicals and energy)
ILO	International Labour Organisation
INCUAL	Observatory of Professions of the National Qualifications Institute
IVET	Initial Vocational Education and Training
ktoe	Kilotonnes of oil equivalent
L&D	Learning and Development
MS	Member States
NGO	Non-Governmental Organisation
NTG	Next Tourism Generation Alliance
NZE	Net-Zero Energy
nZEB	Net-Zero Energy Building
OECD	Organisation for Economic Cooperation and Development
OPCAs	*Organismes paritaires collecteurs agréés* (Approved joint collection organisation)
PES	Public Employment Services
R&D	Research and Development
SEA	Swedish Energy Agency
SMEs	Small and Medium-sized Enterprises
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical and Vocational Education and Training
VCI	*Verband der Chemischen Industrie e.V.*
VDAB	Flemish Service for Employment and Vocational Training
VET	Vocational Education and Training
VGU	Volvo Group University
VLAIO	Flanders Innovation and Entrepreneurship
Vs.	Versus

1 Introduction

1.1 Purpose

The general objective of this project is to support Flanders in the development of a high-level strategy together with an implementation roadmap and a governance framework to guide and support skills development for the green transition. This includes highlighting opportunities to overcome the main skills bottlenecks holding back the green transition in Flanders. During this project particular attention is given to the social effect on citizens and vulnerable groups, to ensure that no one is left behind in the transition. The primary beneficiary of the outputs of this project is the Flemish Department of Work and Social Economy (DWSE). This project is carried out with funding from the European Union via the Technical Support Instrument and in cooperation with the Directorate-General for Structural Reform Support of the European Commission.

The previous stage of this project consisted of a literature review on the topic of green skills and jobs, as well as labour market dynamics and the education system using studies covering the Flemish as well as the international and EU context. A methodological tool was also developed and used to estimate the evolution of employment per NACE 2 economic sector for Flanders, based on estimated sector growth in a green transition scenario for 2022-2030. The final report of the previous stage served as an important basis for this deliverable. Some of the conclusions from the previous report of particular interest to the present report are:

- The green transition is expected to have a positive overall impact on jobs and economic growth;
- Skills gaps already exists in Flanders, the green transition could put even more pressure on certain sectors/skills;
- There are specific technical skills needs from the green transition, but the report emphasises especially the need for generic STEM skills, lifelong learning and professional and cross-cutting skills;
- Lifelong learning is currently emphasised as an issue as most of the 2030 workforce is already part of the workforce today and there will thus be a significant need for upskilling and reskilling;
- There are risks in not addressing skills needs for the green transition, such as insecurity, labour shortages and skills gaps;
- Flemish policy frameworks provide a good basis for action, but these need to be updated;
- Flemish institutions and stakeholders are active, and some initiatives are already ongoing – however, further mobilisation, particularly for the circular economy, construction, energy and manufacturing sectors, is needed to address the challenge; and
- The cross-sectoral nature of the key skills challenges lends itself to cross-sector cooperation.

In addition to the above conclusions, the report also points to a need to learn from other countries on how they promote lifelong learning, STEM skills and professional and cross-cutting skills. It is also important to understand how specific technical skills needs are addressed in other countries in the sectors identified as most impacted in Flanders, i.e.: circular economy, construction, utilities (energy), and manufacturing. Furthermore, identifying international best-practices in cross-sectoral cooperation and cooperation between authorities, labour market and educational systems could provide crucial lessons for Flanders and their green skills development.

The aim of the present study is to assess best practices[1] of relevance to the green skills transition in Flanders from a selection of other countries/regions.[2] It reports on the following activities:

- A review of best practice activities to support green skills and job transitions – including roadmaps and governance frameworks that have been created and implemented in other countries;
- Study visits to two countries (Sweden and France), where a delegation from the Flemish Department of Work and Social Economy and the Extended Project Board discussed the context and the specificities of the respective countries, and the possible lessons that can be applied to the Flemish situation (see Annex I for the participants);
- An online session with experts from one of the countries visited (Sweden) in order to deepen the understanding of the situation in this country; and
- An online peer exchange for representatives of the Flemish government, other members of the Extended Project Board and representatives from OECD and DG Employment, who could take part in a discussion between experts from four other countries (Sweden, France, Ireland and the Netherlands) selected for their hands-on experience on the topic of green skills in the construction sector. The country experts first presented the projects/initiatives they are part of and then exchanged on their experiences with actor involvement, the green skills policy context and financial support. (See Annex II for the participants).

The countries which were selected for the study visits and online follow-up session stemmed from an initial long list, developed by the consultants in cooperation with the Extended Project Board. The selected cases were intended to provide insights into various elements of the roadmap which needs to be developed for Flanders, i.e., making high-level strategic choices, sectoral goals and detailed actions on green skills and jobs. This list consisted of the following countries where interesting projects are being or have been executed: Denmark, France, Romania, Finland, Sweden, The Netherlands, Estonia, Philippines, Australia, Spain and Luxemburg. To shorten the list and arrive at two cases, we used the following **selection criteria**:

- Relevance of the key sectors identified in the proposal and the work carried out under the previous report on 'Green Skills Needs in Flanders' . The key sectors were: circular economy, construction, utilities (energy), and manufacturing;
- Selected cases should be in an advanced stage of implementation, e.g., Sweden (greening of industries & focus on unemployed), France (National Observatory for Jobs and Occupations of the Green Industry), Denmark (maritime sector), even if it concerns a (sub-)sector not directly relevant to the situation in Flanders; and
- Practical aspects: budget, availability of key experts, having time to host a delegation from Belgium, etc.

Based on these criteria, Sweden and France were selected.[3] Much of **Sweden's training infrastructure** operates at a regional level which presents some similarities to the situation of Flanders and there are multiple ongoing projects and initiatives linked to the upgrading and greening of skills. In particular, the region of Gothenburg has an industrial landscape which is similar to Flanders. **France** has a governance structure with a strong focus on sectoral social dialogue that works in a similar way to that

[1] Best practice is defined as an initiative related to a green skills policy which has proved to be successful in the sense that the practice has already provided tangible and measurable results in achieving a specific objective.
[2] The best practices presented here do not always involve green skills, but they all have relevance to the green skills transition
[3] Participants of both study trips and the organisations visited are listed in Annex I.

of Belgium/Flanders and thus lessons learned can be extrapolated to the Flanders' context in an efficient manner. Both Sweden and France have recently introduced measures with important consequences for the labour market and therefore, indirectly, for skills development of their present and future workers.

For the peer exchange, two additional countries, namely **Ireland** and **Netherlands**, were selected from the cases already discussed in the literature review as they also dealt with skills issues in the building industry.

1.2 Context and definition of green skills development

The green transition will have a profound impact on the European (and Flemish) economy. According to a flagship Cedefop study into the impact of the European Green Deal (EGD) on skills[4] it is expected that between 2020 and 2030, as a result of the EGD, employment in the EU-27 will increase by around 3.7%. It estimates that the implementation of the EGD is likely to increase GDP in the EU by around 1.7% (in 2030, compared to the baseline) and lead to additional employment growth. In the entire forecast period, employment with the implementation of the EGD is higher than without it. Belgium has the highest projected growth in employment as a % difference compared to the baseline.[5]

The green transition will impact the European and thus the Flemish labour market through four channels. First, new jobs will be created in certain sectors (job creation). Second, there will be a shift between jobs within sectors (job substitution). Third, certain jobs or subsectors will disappear (job destruction). Lastly, the tasks and activities of existing jobs will change or expand, implying a need for new skills. There will be an increasing demand for employees with skills for the green transition, to help ensure their companies are resilient to future changes. Therefore, the green transition not only creates new jobs but also creates a significant need for reskilling and upskilling in all sectors.[6]

Before considering international best practices, it is important to set out our understanding of green skills since different countries use different frameworks. The definition of green skills selected for this study is aligned with that used by the European Commission (DG Employment), Cedefop and the OECD. In this definition green skills are comprised of several types of skills, namely technical skills (specific to occupations), professional skills (these can be applied across occupations, for example analytical or management skills) and cross-cutting skills (these are related to the need for society to adopt in a broad sense in order to enable the green transition, for example understanding of sustainability or lifelong learning).

1.3 Flemish background on green skills development

In the previous step of this project an in-depth analysis on green skills in Flanders, based on a literature review, stakeholder consultations and a forecasting modelling exercise, was undertaken. This section summarises the most relevant conclusions from this analysis.

[4] Cedefop (2021). The green employment and skills transformation: insights from a European Green Deal skills forecast scenario.
[5] The study does not provide an explanation for the highest projected growth in employment in Belgium.
[6] De Smet & Lamberts (2012). De transitie van België naar een koolstofarme samenleving in 2050 - De uitdagingen voor tewerkstelling, vorming en opportuniteiten voor kmo's.

Many skills gaps have already been identified in Flanders in various sectors (e.g., construction sector and utilities/energy sector)[7] and are seen as a serious issue. The green transition could put even more pressure on certain sectors/skills worsening this problem. Additionally, there are risks in not addressing the skills need for the green transition – these include not only lagging behind in the achievement of environment and climate-related policy goals and targets but also tangible social and economic impacts. For instance, failing to take action could lead to some sections of the labour force not possessing the required skills, possibly getting left-behind and exacerbating social inequality. Economically, this could also place a constraint on firms' abilities to expand and thus reinvest in Flanders. A slow transition would also slow down the implementation of renewable energy and other technological developments, with higher prices and pollution among the likely results.

The green transition gives rise to specific technical skills needs, but more importantly and with a greater degree also to an increasing need for Science, Technology, Engineering and Mathematics (STEM) skills, lifelong learning and professional and cross-cutting skills. Some specific technical skills such as skills required by installers of solar PV installation and heat pumps, skills such as sustainable architecture, sustainable chemicals, and repair and engineering skills, are in high demand in Flanders. However, in the current policy framework more attention is given to the pipeline of STEM qualified workers, as these can then be specialised in many different technical disciplines. Professional and cross-cutting skills are also emphasised. These more generic skills are required by a broader share of the workforce than technical skills. Another gap that was identified is the lack of a lifelong learning culture in Flanders, although this issue is far from unique to Flanders. This hinders the possibilities of enhancing the skills of existing workers to adapt to the green transition, and/or to learn new and emerging green skills. This is crucial as most of the 2030 workforce are already working in 2022. Employees are often not sufficiently inherently or externally incentivised to attend training courses or redirect their careers (upskilling/reskilling). Improving lifelong learning culture, provision and support is seen as crucial to address skills issues arising under the green transition.

The current economic vision for Flanders among public policy makers includes skills, at least partially, but these may need updating following the major green policy developments at EU-level. Flemish institutions and stakeholders are active, and some initiatives are already ongoing. However, further mobilisation, particularly for the circular economy, construction, energy and manufacturing sectors, is needed to address the green skills challenge.

1.4 Reading guide

After a presentation of the context and background on the Flemish situation regarding green skills, the following chapters of the report present a number of practices found in other EU Member States on green skills from various points of view.

- In Chapter 2, we review several vision documents and policy instruments used across Member States to mitigate the shortages of green skills for the present and future labour market.
- In Chapter 3, we zoom in on vocational training and the different approaches countries take to prepare their education systems for an increased demand for green skills.

[7] OECD (2017). Boosting Skills for Greener Jobs in Flanders, Belgium.

- Chapter 4 looks at the work done by Public Employment Services (PES) in a number of EU countries, both in their task of analysing the (future) needs of the labour market for green skills, and at the role they play in finding work for the unemployed.
- In Chapter 5, we present cases from different countries on how stakeholders from the public and private sector and civil society interact to mitigate the shortages of green skills.
- In Chapter 6, we discuss how the private sector (both large and small companies) are taking up the challenge of improving the green skills of their employees.
- In chapter 7, we discuss the relevance of the key takeaways from cases found across Europe, from which recommendations are distilled.

2 Strategies, policies and roadmaps

In Flanders, labour market policies, and – more generally – documents setting out a vision for Flanders' future, show an increasing awareness of a green transition and the related needs for green skills, but, as was concluded in the report of the previous research steps of this project, these need updating following the major green policy developments at EU-level. In this chapter we review the various policy instruments found in other EU countries that address labour market issues designed to mitigate the shortages of green skills, focussing on vision and strategies (2.1), policies and regulations, roadmaps and programmes (2.2), and sectoral roadmaps at EU level and national applications (2.3).

2.1 Visions and strategies: the high-level perspective

In 2020, the Commission presented its communication on the "European Skills Agenda for sustainable competitiveness, social fairness and resilience",[8] in which it calls for a comprehensive approach to up- and reskilling (among the whole value chain), to be embedded in national skills strategies and in training and education systems. However, as concluded in the report on the previous phase of this project: "policies related to the labour market (often) do not clearly and specifically mention green skills". The increased attention on green skills and their importance to sustainable growth did not lead to the formulation of high-level visions and strategies specifically targeting green skills. Instead, as we will see in the case studies discussed below, most countries rely on action plans, sector policies and programmes that incorporate green skills. Below, we discuss two cases that are an exception to the previous conclusion: France and Germany do have a coherent strategy for green skills.[9]

France: A national strategy

In France, an attempt was made to develop a strategy with an important green skills component, first through the *Grenelle de l'environnement* – environment round table launched in 2007 – and then through the Paris 2015 climate change conference. This largely provided the basis for the second national strategy for sustainable development (2009-2012), as well as the follow-up plan, launched in 2010, to mobilise territories (Plan de mobilisation des *territoires et des filières*). The aim of this plan was to enrich green growth by supporting the development of new activities and adapting skills. This new strategy also introduced the principle of a national climate conference to be held annually, to reignite the multi-level governance process introduced by the *Grenelle de l'environnement* and to revive the enthusiasm of the round table, which had begun to lose momentum.

Title	National strategy for sustainable development
Country	France
Type of intervention	National strategy
Institution	National government

[8] COM(2020) 102 final. A New Industrial Strategy for Europe.
[9] In this context it is notable that in 2020, the European Economic and Social Committee issued an opinion "Towards an EU strategy for enhancing green skills and competences for all" which – among others - called for "the establishment of national policies, focussing on education on environmental responsibility and green skills, as well as pro-active upskilling and reskilling to facilitate the just transition to a green economy for all".

Title	National strategy for sustainable development
Why is it a good practice?	The national strategy for sustainable development and the plan for the mobilisation of territories are good examples of high-level strategies that make green skills an integral part of the agenda. The practice also shows the importance of bringing together a group of experts to discuss the needs and challenges surrounding green skills and the broader green transition.
Relevance for Flanders	The Flemish long-term sustainability Strategy 'Vision 2050' identifies seven transition priorities: seven transition priorities to help make the necessary changes: Circular Economy; Living, Learning and Working in 2050; Industry 4.0; Living Together in 2050; Mobility; Energy and Climate; and Environment for the future. For the priorities Circular Economy and Industry 4.0, skills and jobs are mentioned as levers for accelerating the transition and also include green skills. However, as opposed to the French strategies, green skills and jobs are only mentioned briefly and quite implicitly.
Recommendations for Flanders	Integrate 'skills needed for the green transition' as a transition priority in the updated 2050 Strategy to emphasise the political urgency and to guide all future policy initiatives of the Flemish government.

Germany: A federal approach to a national strategy

In Germany, the Federal Government developed a National Skills Strategy.[10] Part of the Strategy is aimed at strengthening the German VET system through the 'Sustainability in Vocational Education' initiative of the Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung – BIBB). The initiative's projects focus on developing new curricula[11] and amending the existing ones focusing on environmental awareness, green skills, sustainability and circular economy for German VET institutions[12]. In 2021, a set of minimum requirements in vocational education have been defined (*Standardberufsbildpositionen*), which constitute a framework which every vocational training must meet. The learning modules – covering topics such as sustainable development; Corporate Social Responsibility (CSR); energy saving and energy efficiency; competencies for sustainable production, etc. – were initially developed for the transport sector but their scope turned out to be relatively broad and, thus, most of them are now also used by representatives of other industries. As the implementation of the Strategy is still in an early stage it is not yet possible to measure its success. However, initial experience points to some challenges that need to be addressed as the implementation on the legislative part did not include details on the practical implementation, including the adaption and establishment in the process of VET in the companies. Questions that are still to be answered include: How can VET trainers get acquainted with education for sustainable development (ESD) or to be more precise vocational education and training for sustainable development (VETSD)? Where can they qualify themselves? In which way are trainers in further education prepared for training the trainers of the companies? As projects have been set up to find answers to these questions, this is expected to be a long and challenging process as the abstract, multi-dimensional, and normative concept of sustainability is in tension within the educational area where concrete action in the

[10] Federal Ministry of Labour and Social Affairs and the Federal Ministry of Education and Research (2019). National skills strategy Germany.
[11] For example, the BIBB has released a handbook with guidelines on developing green skills for companies and organisations 'which systematically and continuously strive to integrate VET into their sustainability concepts' in the chemical industry. All the theoretical information is supplemented by illustrative examples from company-based case studies.
[12] Bundesinstitut für Berufsbildung. Website: Materialien und Produkte aus den Modellversuchen des Förderschwerpunkts "Berufsbildung für nachhaltige Entwicklung 2015-2019".

professional situation is of such high value and the diffusion of ESD in VET is therefore described as slow.[13]

The initiative has not been transferred to other national contexts, but some of its parts have been up-scaled since its first programme was launched in 2010. While conceptually the initiative could be applied in other Member States, it is worth mentioning the special structure of the German dual VET system: the dual system is firmly established in the German education system. The main characteristic of the dual system is cooperation between mainly small and medium sized companies and publicly funded vocational schools. This cooperation is regulated by law. The majority of Member States including Belgium do not use this structure for VET education, and therefore might experience problems in implementing a similar approach as it relies on cooperation between VET institutions and local businesses. At the same time, Member States such as Austria or Italy, which have similar VET systems could benefit from the BIBB experiences with the initiative.

Title	National Skills Strategy
Country	Germany
Type of intervention	National strategy
Institution	Federal government & Federal Institute for Vocational Education and Training
Why is it a good practice?	The success of the strategy is attributed to two factors.[14] First, the programme offers a wide variety of skills delivery methods and educational materials in the framework of a broad systemic approach which introduces sustainability-related concepts and green skills into German VET. Second, all the materials in the initiative are developed in cooperation with local businesses and their representatives (i.e., unions, chambers, and employer organisations) which helps to ensure the practical applicability of the materials and that economic reality is reflected in specific curricula. Limitations of the strategy were found in the limited funding provided to the multiannual training programmes which often lead to the exclusion of green skills in VET-related projects. Secondly, the complex 'double' nature of the skills delivery task slows down the implementation process. On the one hand, in order to develop project materials, the BIBB has to do research and see how sustainable competencies can be integrated into VET curricula. On the other hand, the BIBB often struggles to find qualified partner companies to cooperate with them in respective projects. Involving Small and Medium-sized Enterprises (SMEs) can be especially complicated because they often lack the time and motivation to assist the BIBB. Finally, there is a challenge of training the trainers. Despite the relatively uniform legal framework at federal level, there is great divergence in how businesses and VET institutions use the BIBB materials at local level (e.g., schools that lack resources and motivation see the sustainability competences as secondary).

[13] Singer-Brodowski, M., Etzkorn, N., & Von Seggern, J. (2019). One transformation path does not fit all—insights into the diffusion processes of education for sustainable development in different educational areas in Germany. Sustainability, 11(1), 269.
[14] SPIRE-SAIS, et al. (2021). Skills Alliance for Industrial Symbiosis: A Cross-sectoral Blueprint for a Sustainable Process Industry.

Title	National Skills Strategy
Relevance for Flanders	In Belgium, the Flemish government has recently introduced reforms on vocational programmes in compulsory education which also stimulates a dual track, offered next to non-dual learning, thus offering the option to learn from the German system. It is not yet clear how successful this reform will prove in practice. Although some smaller-scale initiatives exist to improve cooperation between companies and learning providers, more strategic partnerships are required.
Recommendations for Flanders	Cooperation between the labour market (companies) and the educational system should be strengthened at the policy level. Not only through practices of dual learning, but also by involving sectors in the development of training schemes, curricula and certifications related to green skills and broader skills development. The aim should be to ensure the highest degree of alignment between the labour market and learning providers. Developing teaching materials (handbooks, guidelines) jointly by the private sector and the education sector (VET in particular) could be a good way to bring curricula more in line with private sector needs.

Spain: Green strategies and long-term plans

In Spain, environmental strategies and long-term plans have been drafted in the recent past on energy efficiency, industrial symbiosis and green employment, such as the National Action Plan for Energy Efficiency[15], and the circular economy policy 'España Circular 2030'[16], both of which contain references to green skills.

The Spanish National Action Plan for Energy Efficiency recognises that in order to make a transition towards a circular economy (CE) that is balanced and fair, it is essential that CE also becomes part of employment and training policies, so that workers adapt to the new model. Thus, the improvement of training in topics ranging from the design of circular products and production processes to the management of supply chains, including the development of new circular business models, must be taken into account by all agents involved. Work is being done along these lines at the Ministry of Labour and Social Economy (MITES) through the State Public Employment Service (SEPE) and the State Foundation for Employment Training (FUNDAE).

The Spanish Circular Economy Strategy "Spain 2030", approved in 2020, lays the foundations to promote a new production and consumption model in which the generation of waste is reduced to a minimum and waste that cannot be avoided is used to the greatest extent possible. This policy makes explicit reference to the need for new skills and it mentions that the government plans to adapt "the workers' capacities and abilities to the labour market's emerging demands" in response to rolling out industrial symbiosis and circular economy. Three measures are proposed to address the expected changes in skill needs, although the strategy does not elaborate how they are to be implemented:

- Adjust the Initial Vocational Education and Training (IVET) and Continuing Vocational Education and Training (CVET) systems according to the emerging skills needs.
- Improve availability of better information for individuals as well as businesses on techniques and best practices for a circular economy.

[15] National Integrated Energy and Climate Plan (PNIEC) 2021-2030.
[16] Ministerio para la Transición Ecológica (2020). España Circular 2030 – Estrategia Española de Economía Circular.

- Promote adaption in businesses to new work safety and hygiene practices related to the green economy.

In parallel to these policies, the Modernisation Plan for VET (*Plan de Modernización de la Formación Profesional*) of July 2020 is the most recent policy document on Spanish VET. The Plan's goal is "creating an environment of economic revival based on the commitment to human capital and talent", and to make the VET system more flexible and more accessible. The plan proposes continued revision of the range of VET programmes, with curricula that incorporate aspects of digitalisation, innovation and entrepreneurship and green development. One of the milestone results of the Plan is the publication of the Organic law for the organisation and integration of vocational education and training.

Title	Various policies focusing on green skills
Country	Spain
Type of intervention	Sustainability policies that include mentions of green skills
Institution	Various
Why is it a good practice?	These Spanish case studies show that it is important and possible to include green skills and jobs as an integral part of sustainable policies and reforms. Although these are mainly focused on the circular economy and related skills, this can and should be expanded to other sectors for the greening of the economy.
Relevance for Flanders	Flanders has several roadmaps, strategies and policies on sustainability and the green transition. However, green skills and jobs are mentioned sporadically, and then lacking context, impact assessments, implementation methods etc. to make it more tangible.
Recommendations for Flanders	Green skills and jobs should get a more prominent place in all sustainability related policies and strategies. Simply mentioning green skills as an important factor is not sufficient. The policies should include a section where the impact on green skills and jobs is estimated and the needs or deficiencies are taken into account.

2.2 Policies and regulations, roadmaps and programmes

As mentioned above, there are a large variety of approaches to advancing the development of green skills found in the different Member States. However, policy-makers often base their recommendations on policies and programmes which were already in place before green skills were identified as a potential bottleneck to stimulate green growth. This lack of overarching strategies and coherent policies can be seen as a barrier to improve green skills across industries and leads to fragmented and short-term funding.[17] In this section, we present a number of practices that focus on more low-level policies, regulations and programmes as well as some existing roadmaps.

Spain: Green Jobs Programme

The *Programa Empleaverde* (Green Jobs Programme) was one of the earliest programmes that promoted the provision of green skills in Spain. Co-funded by the European Social Fund (ESF), the goal

[17] SPIRE-SAIS, et al. (2021). Prototype of the Blueprint New Skills Agenda Energy Intensive Industries.

of the initiative was to increase the provision of skills for green jobs to promote the greening of the economy and employability of workers.[18] The programme was active during two ESF periods: 2007-2013 and 2014-2020. In the second period more attention was paid to the participation of unemployed workers. Up to 2020, the *Programa Empleaverde* resulted in nearly 400 co-funded projects, collaborations with 500 organisations, support to 1,300,000 recipients, and the creation of 2,600 companies and business linked with environment[19]. From 2007 to 2015[20], 60,000 employed workers (32% women) from 24,000 entities (94% SMEs, 3% large companies and 3% NGOs) received training. In addition, the programme contributed to the creation of 3,500 direct jobs and 2,600 green start-ups and businesses.[21]

Title	*Programa Empleaverde* (Green Jobs Programme)
Country	Spain
Type of intervention	Programme to stimulate green jobs
Institution	Ministry for the Ecological Transition and the Demographic Challenge and European and private partners
Why is it a good practice?	The programme was effective in reaching its objective of increasing the availability of workers qualified in green skills and thus stimulating green jobs and the greening of the economy. However, it did not provide a strategic approach for green skills development or addressed more fundamental issues of basic training in green skills and structural shortages of green skills across the different industries. The strength of the initiative was - among others: the diversity of initiatives and target groups which increased the probability that long term impact is created, and the programme addresses challenges of different target groups (unemployed, entrepreneurs).[22]
Relevance for Flanders	Flanders does not currently have a programme that solely focuses on the stimulation of green jobs and skills. There are some policies and programmes that include them as an added value, but rarely as an integral part of the initiatives.
Recommendations for Flanders	Consider introducing a programme that focuses solely on green jobs and green skills in the broad sense and provides funding as well as a strategic framework for their development. This could be in the form of training programmes for upskilling and reskilling, establishment of green start-ups, creation of green jobs in established companies, etc.

France: Les Elles du BTP

A French initiative which may have relevance to Flanders is the *Les Elles du BTP* (Women of the Construction Sector), in the Alsace region that seeks to communicate construction sector career opportunities to women.[23] The on-going efforts to green the construction sector generated a need for

[18] Gobierno de España. Website: Emplea Verde.
[19] Gobierno de España. Website: Emplea Verde.
[20] No data available on the second period
[21] No definitive results for the 2014-2020 period are available yet as the period is currently ongoing. There have been positive impacts on environmental awareness, improvement of biodiversity and of fertility of soil.
[22] SPIRE-SAIS, et al. (2021). Skills Alliance for Industrial Symbiosis: A Cross-sectoral Blueprint for a Sustainable Process Industry.
[23] OECD (2012). Enabling Local Green Growth - Addressing climate change effects on employment and local development.

new skills such as those required to comply with new regulations (e.g., energy efficiency standards). This was perceived as a good opportunity to increase the participation of women in the construction sector because certain green skill-sets are likely to require a balance of physical and technical skills.

Title	*Les Elles du BTP* (Women of the Construction Sector) initiative
Country	France - Alsace region
Type of intervention	Initiative for participation of women in the construction sector
Institution	The programme is supported by numerous actors, including the French Federation of the Construction Sector, the Regional Government of Alsace, the Chamber of Crafts Industry and the Women's Construction sector Group of the in the Haut-Rhin region.
Why is it a good practice?	The initiative leverages actions such as customised training and meetings with a network of women already working in the construction sector who share their experience. This enhanced the visibility of the possible roles for women in the sector.
Relevance for Flanders	In Flanders, only 9.3% of employees in the construction sector are women (6% for self-employed)[24]. With 8.900 vacancies in the Flemish building in August 2022[25] and given the fact that building trades are rapidly becoming more digital, technology driven and green and thus go beyond purely physical jobs, women could largely fill these vacancies.
Recommendations for Flanders	Increase the outreach to women for filling vacancies in the construction sector, especially for non-physical jobs since these are also facing major shortages (e.g., environmental monitoring, planning and communication, ensuring energy efficiency of new buildings, etc.).

France: Roadmap for Employment

The French agency ADEME has developed a roadmap for employment in relation to the green transition, covering the period 2021-2023 with the aim of constructing the conditions for an ecological transition that creates jobs.[26] One of their axis upon which they will base the actions in the roadmap is to prevent a shortage of skills for the green transition. They have established that the main challenge will be to coordinate the actions and visions of employment, economic and territorial actors and find support for green skills development. More specifically, they will deal with this challenge through (1) anticipating the needs for the energy efficient renovation of buildings and (2) deploying engineering to prevent skills shortages. For the energy renovations, the government agency will use existing dialogue support tools such as the 'Support for Prospective Market and Job Dialogues' (SDP). This system is explained in more detail in the textbox below.[27] Preventing skills shortages will be achieved through setting up cooperation networks between different sectors and different professions within sectors. One area of focus here will be the shortage of engineers and STEM skills. Based on the objectives from public energy and environmental policies, for each economic sector it will be determined which geographical levels should be mobilised first, how and by which actors.

[24] Confederatie Bouw (2022). Aantal vrouwelijke werknemers in de bouw met 19% gestegen op 5 jaar tijd.
[25] Embuild (2022). Bouwvacatures bereiken ongeziene hoogte.
[26] ADEME (n.d.). Coconstruire les conditions d'une transition écologique créatrice d'emplois - Feuille de route pour l'emploi, période 2021-2023.
[27] ADEME (n.d.). Développer l'emploi et la rénovation énergétique des logements avec le Support aux Dialogues Prospectifs (SDP).

Developing employment and energy renovations of buildings – Cambrai region

ADEME and Alliance Ville Emploi, together with other partners established a strategy and roadmap for solving the skills shortage issue and stimulating job creation, based on an experiment conducted in the region of Cambrai. The SDP method was first created in 2015 as a way of forecasting the needs for jobs and skills for the green transition and then tested and perfected in 2019 by implementing it in Cambrai (165,000 inhabitants). More specifically, it is a simple tool for mobilising all the stakeholders in a given territory in order to initiate and support a dialogue, integrating both skills and employment market issues in the local implementation of public policy aimed at improving the energy performance of buildings. Using the method in Cambrai, through working groups, they were able to identify barriers to energy-efficient renovation and opportunities to help homeowners renovate homes at a national and local level. These were then extrapolated to general recommendations for optimising the SDP method and applying it in different French territories. The method was also integrated into the French Roadmap for Employment.

Title	Roadmap for Employment
Country	France
Type of intervention	Roadmap for employment and skills
Institution	ADEME and Alliance Ville Emploi
Why is it a good practice?	The establishment of the French roadmap for employment happened in an unusual way. One of its main components is a method or tool for mobilising all the stakeholders in a given territory in order to initiate and support a dialogue on employment and skills, specifically in energy efficient renovations of buildings. They perfected this method by testing it in the Cambrai region before making it a core element of the roadmap. By adopting a regional perspective and focusing on a single sector first, they enlarged the scope in steps to encompass the whole of France by the end of the process.
Relevance for Flanders	There are several sectors in Flanders which will be impacted more severely than others due to the green transition and which will have higher needs for green skills. Therefore, it could be beneficial to focus on the more urgent sectors first and the enlarge the scope of the strategy in a later stage to involve all sectors.
Recommendations for Flanders	Consider establishing roadmaps for improving the green skills shortages in specific sectors (and/or) regions and implement these, beyond work already done for the energy sector. Based on the successes and failures of this work. This can support the results of the current project. By working in smaller steps and enlarging the scope each time, there will be more opportunities for learning and optimisation of the roadmap to ensure successful implementation.

Germany: The "Power Saving – Check" Programme

In Germany, the "Power Saving – Check" Programme, which started in 2009, is an example of a programme to increase the demand for green products and services and thereby for green skills by raising awareness of climate change and other green issues. Through the system, low-income households can participate in a power-saving check to make their homes more energy efficient and

thereby lower their energy bills. The programme trains unemployed people to provide advice on power consumption checks, followed by free assistance such as installing energy-saving LED lights, switchable power strips, TV standby shutters and timers.

Title	Power Saving-Check Programme
Country	Germany
Type of intervention	Programme for increasing the demand for green products and services
Institution	The programme is funded by the Federal Ministry of Economy and supported by the German Caritas Association and the Federal Association of Energy and Climate Protection Agencies in Germany.
Why is it a good practice?	According to the Federal Ministry of Economics, by 2019 more than a million people had taken advantage of the Power Saving-Check.[28] The programme has succeeded in training up to 8,000 people to conduct the energy checks. More than half of these people leave the programme to find related jobs with other employers.[29] This has increased the availability of workers trained in green skills in Germany.
Relevance for Flanders	The programme shows similarities to the Flemish 'Energy Scan' (*Energie scan*) which is free for low income households. However, in Flanders, the checks are carried out by the staff of Fluvius, the Flemish system operator for electricity and natural gas.
Recommendations for Flanders	Expanding the scope of the Flemish programme Energy Scan to increase its popularity beyond low-income households, could provide additional demand for green (energy-efficient) products and services. Furthermore, by making training an integral part of the programme and focusing this on the unemployed population of Flanders, green skills shortages and unemployment could be improved.

Netherlands: Energiesprong

In the Netherlands, the government funded *Energiesprong* programme was launched in 2010 to develop viable Net-Zero Energy (NZE) retrofit solutions for the mass market in which raising awareness amongst home owners is also an essential element. Although the aim of this programme was to achieve energy savings in the built environment, it created an increased demand for skilled workers in the building (retrofit) sector. One of the projects stemming from this programme was a deal between six housing associations, four construction companies and several other supporting organisations to retrofit 111,000 homes to NZE standards.[30] This allowed construction companies to gain experience in NZE projects and required skills which then spread throughout the industry. The success of this programme has led to it being replicated in other countries, for instance the UK and France aim to apply this model and retrofit about 100,000 homes each over the coming years. A similar approach is also now being adopted in Ireland, where the programme manager commented that its success will depend on contractors making significant and time-consuming changes to assimilate different products and upskill their staff.

[28] Bundesregierung (2022). Bundesregierung unterstützt Haushalte mit niedrigem Einkommen beim Energiesparen.
[29] Caritas (2019). Stromsparhelfer finden zurück auf den Arbeitsmarkt.
[30] European Commission – CORDIS (2018). Make Net Zero Energy refurbishments for houses a mass market reality.

The Dutch energy programme was one of the drivers of a renovation wave, the others being the material transition, the climate transition and the digital transition. It is becoming increasingly clear that these separate drivers can be bundled into one overarching driver: the circular transition and all actors involved will need to be taught how to deal with this circular transition. Train the trainers is therefore crucial.[31] To assist in this process a skills advisor app was developed: people can select their sector and occupation and then see what the challenges are for each activity and these are then linked to trainings or online courses or handbooks where they can develop specialized skills.[32]

Title	***Energiesprong*** Programme
Country	The Netherlands
Type of intervention	Programme to stimulate Net-Zero Energy retrofitting
Institution	Funded by the Dutch government until 2016 and privately continued from then on.
Why is it a good practice?	Some valuable lessons learned from the *Energiesprong* programme came from its implementation stage. The programme had a significant impact on the construction industry, as companies got the opportunity and stimulation to learn and apply green practices in NZE. However, the programme faced the issue of insufficient number of qualified workers and the high investments required to develop these green skills in their employees. These shortages led to the discontinuation of funding from the government for the programme in 2016, although activities continued under private sector management.
Relevance for Flanders	The Government of Flanders has supported energy renovations to accelerate the growth of energy efficient houses for several years.[33] However, the uptake is small and there are only a few large scale programmes which deal with skills issues and energy efficiency at the same time.
Recommendations for Flanders	It is not sufficient to provide funding or incentives for companies to become active in Net-Zero Energy retrofitting (or similarly in energy efficiency). The Flemish government should coordinate NZE actions with actions focussed on improving the skills of the workers in this sector.

2.3 Sectoral roadmaps at EU level and national applications

At EU level, there are several initiatives that address the issue of green skills, either directly or indirectly. Below we discuss two of those initiatives, both of which are applied at national level.

[31] Source: Project Peer exchange green skills (February 2023), Jan Cromwijk, ISSO.
[32] *Ibid.*
[33] Support measures such as: i) Renewed EPC from 2019 with concise advice and recommendations to bring the home to an A label; ii) EPC label premium since January 1, 2021 for homes that go from a bad to a good label; iii) From 2021, interest-free renovation credit when purchasing a home with label E or F, linked to label objective that is set; iv) from 2023 renovation obligation to label D or better for homes with label E or F that are sold; v) My Renovation Loan up to 60,000 euros since September 1, 2022 for energy-efficient renovations; and vi) My Renovation Premium since October 1, 2022.

Ireland: Build Up Skills Roadmap

The first initiative is the BUILD-UP Skills programme, which developed roadmaps[34] on energy efficiency and renewable energy in 30 European countries, including Belgium.[35] BuildUp Skills is a strategic initiative initiated by the European Commission in 2011 under the Intelligent Energy Europe programme and is one of the few examples of roadmaps to plan for greening skills.[36] The primary aim of the initiative was to increase the number of trained and qualified building professionals across Europe to deliver building renovations offering high-energy performance as well as new nearly zero-energy buildings. In **Ireland**[37], the project lasted from November 2011 to 2013 and the project consortium included five members: Limerick Institute of Technology (Coordinator), Dublin Institute of Technology, Institute of Technology Blanchardstown, Construction Industry Federation and Irish Congress of Trade Unions. A broad spectrum of stakeholders was engaged in the process, including public authorities, national energy and qualifications bodies, training providers, trade representative organisations, industry representatives, social partners, building design experts and potential financing bodies. The main aim of the Roadmap was to outline a general strategy and a set of specific actions required to overcome the barriers for addressing the knowledge and skills gaps amongst the construction workers to meet the 2020 targets in the building sector. By identifying specific actions, timelines and stakeholders responsible for their implementation as well as receiving endorsement from these stakeholders, it was envisaged that the roadmap would be a catalyst for change in the construction industry. Its objective was to ensure that construction workers in Ireland have sufficient knowledge and skills to build and retrofit buildings that will achieve low energy performance.

Six regional consultation workshops were held which focused on getting the views of the construction industry on what the overall strategy for fulfilling the training needs should be as well as specific issues, such as the course content, qualifications and barriers for the roadmap implementation. In addition, one to one interviews were carried out with the strategic stakeholders focusing on the elements of the overall strategy and achieving endorsement and a survey questionnaire was distributed to the construction workers and employers, aiming to assess their knowledge and attitudes towards low energy buildings. The survey was also used to test some of the results from the consultation process around various issues, such as who should pay for training, main barriers for training uptake and so on. Finally, the roadmap was presented to relevant Governmental Departments and Agencies for their endorsement of the proposed actions. However, the roadmap identified several barriers to the implementation of a new up-skilling initiative at EU scale, such as:

- Multi-stakeholder coordination: many stakeholders directly or indirectly involved in the implementation of the energy policy are required to agree on and endorse the initiative.
- Establishment and maintenance of standards for professional practice: in several countries (Ireland is an example), there is lack of requirement for those employed in the construction industry to provide proof of competence.
- Structure of the building sector: changes in building methods have led to more narrow specialisation amongst trades, reducing the number of workers with broad skills in the sector.
- Language barriers: in 2010, non-nationals accounted for nearly 10% of those employed in the sector.

[34] Roadmapping is a well-researched field, as the website of Dr. Rob Phaal demonstrates. However, most of the work is theoretical and systemic and relates to technical and business development.
[35] BUILD UP Skills. Website: About BUILD UP Skills.
[36] European Climate Infrastructure and Environment Executive Agency. Website: Funding a Green Future for Europe.
[37] BUILD UP Skills (n.d.). BUILD UP Skills – Ireland: National Roadmap for Energy Training in Construction.

- Composition of the labour force: a need to motivate younger people and girls in particular as there is a gender imbalance.
- Capacity of training providers: as a result of the downturn in the building industry in the period before 2000, the demands on the traditional providers of craft apprenticeship training have been greatly reduced leading to a loss of experienced trainers in many cases.
- Employment opportunities: the main motivation for a construction worker to engage with an up-skilling programme is to improve their prospects for gaining or sustaining employment. Any national programme of training would have to clearly identify a relationship with existing or upcoming job opportunities.

Title	BuildUp Skills Roadmap
Country	Various countries (EU programme) – Ireland case study
Type of intervention	Roadmap for upskilling in the construction sector
Institution	Funded by the European Union and executed by a consortium of Irish actors
Good practice	By the end of the roadmap project, it was concluded that in regards to training, an agreement is needed on a minimum standard of training for those working in the construction sector. There is also a need to provide training in a range of modes and locations to facilitate the needs of construction companies and workers, and the costs of training should be reasonable and equally spread across industry, public sector and trainees. Furthermore, as described above, the roadmap identified several barriers to implementing up-skilling initiatives at EU scale. These barriers also apply to green skills initiatives such as the Irish case.
Relevance for Flanders	Belgium also participated in the BuildUp Skills initiative at the European level and established a roadmap which was to be implemented by a consortium existing of the Fund for vocational training in the construction industry (fvb-ffc Constructiv), the Scientific and Technical Centre for the Construction Industry (CSTC), the Flemish Energy Agency (VEA) and the Directorate General for Energy (DG04).[38] However, the implementation was not considered strong enough to receive continued funding in the later rounds by the EU, as opposed to the Irish case.
Lessons or recommendations for Flanders	The BuildUp Skills programme implemented in 30 European countries, including Belgium, is a good example of setting out a roadmap. It shows strategies and actions to address practical issues (barriers) such as knowledge and skills gaps amongst construction workers, the need to organise multi-stakeholder coordination, the lack of requirements for those employed in the construction industry to provide proof of competence, etc.

[38] BUILD UP Skills (2012). BUILD UP Skills Belgium: National Roadmap.

Austria: Skills Strategy Roadmap for the Additive Manufacturing sector

The second illustration of the process of designing a roadmap at European level is the Skills Strategy Roadmap[39] for the Additive Manufacturing[40] (AM) sector, a modern sector, also firmly established in Flanders[41], where technical and green skills are an essential ingredient of success.

A trans-European project 'Sector Skills Strategy in Additive Manufacturing' fully funded by the EU through the Horizon 2020 Industrial Leadership programme[42] aimed to deliver a shared vision and collaborative skills solutions capable of fostering and supporting growth, innovation and competitiveness in the AM sector. The SAM project identified strategic objectives in order to address the key challenges[43] facing the sector. The roadmap allowed the consortium[44] to present a clear analysis of the path it was going to take for the following two years of activities, particularly on how the Skills Strategy would evolve, adapt and adjust to the trends in the sector, as well as the contingencies in place to face future uncertainties. Although the project concerned the design of the roadmap and results are not yet (publicly) available, some interesting features can be extracted from the project documents:

- The roadmap was developed with the involvement of around 100 external experts through physical meetings and remote surveys.
- The roadmap was also validated through a public online survey, collecting positive feedback from European experts and stakeholders.
- In particular, an impact assessment which was performed enabled the Consortium to group the high impact actions, thus identifying a short list of priorities to be implemented in the short and medium term.
- Priorities were defined in both technical and non-technical domains. The latter included, among others, developing education and training modules, both with links to higher education curricula and on-the-job training approaches.

The Skills Strategy Roadmap was designed with inputs from industry representatives and developed to address key barriers such as:

- Mismatch between industry needs and educational/training offer: As with most disruptive technologies, the AM sector growth and development happens more quickly than the pace of learning and the adaptation of the educational system. This lag generates a gap where there are simply not enough skilled professionals or/and workers with the skills needed to fill jobs and thus meet the demand from the AM employers. Mitigating actions consisted of i) engaging industry in the identification and validation of the necessary skills and training programmes; ii) supporting the link between training development and standardisation activities; and iii) ensuring that a link between stakeholders of AM value chain in terms of skill needs is introduced.
- A lack of AM awareness among the younger generation is reflected in the mismatch between supply and demand of AM workers in Industry, Actions: i) Formulate strategic and future-

[39] EWF, et al. (2021). European AM Skills Strategy.
[40] AM technologies refer to a group of technologies that build physical objects from Computer Aided Design data.
[41] An example is ATLAS COPCO (www.at-lascopco.com), specialised in industrial applications based in Antwerp
[42] CORDIS. Website: A strategic approach to increasing Europe's value proposition for Additive Manufacturing technologies and capabilities.
[43] i) Mismatch between industry needs and educational/training offers; ii) Shortage of training centres, specially at VET level; iii) Sector and process specific requirements for AM, that are also reflected on the qualifications of professionals ; iv) Fast evolving technology and industry; v) Lack of AM awareness among the younger generations; vi) Necessity of more "infrastructures" for AM training.
[44] See factsheet of the project for members of the consortium (https://cordis.europa.eu/project/id/723560).

oriented visions for AM-related skills and their national roll-out; ii) Ensure that sector and/or specific skills/qualifications are identified and addressed; iii) Develop the use of AM at different school levels; and iv) Create AM awareness 'activities' that can be used by schools according to the age of students.

An illustration of AM road mapping at Member State level is found in Austria. Whereas the intention was first to develop a roadmap for Research, Technology and Infrastructure, it was soon decided this would be too broad and roadmaps should focus on only a few specialised areas such as AM and developed with the involvement of a broad range of stakeholders. The roadmap focused on "Securing and building sustainable human resources" as it was found that the shortage of young people in the engineering sciences would continue to worsen in the near future, even more so for additive manufacturing, as there are only a few attractive training opportunities today.[45] In Austria, one of the causes for the lack of young academic-technical talent is the exclusion of technical-scientific subjects in the higher schools of general education (*Allgemeinbildende Höhere Schulen*[46]). This is also one of the main reasons for the imbalance in the proportion of women in engineering studies (mechanical engineering, materials science, computer science, mechatronics, etc.). In this context, appealing training opportunities must be created that provide young people with professional access to the digital world of tomorrow. AM is basically a topic that arouses great interest among young people; appropriate programmes, updating of curricula and activities must promote these interests.

Title	Skills Strategy Roadmap for the Additive Manufacturing sector
Country	Various countries (EU programme) – Austria case study
Type of intervention	Skills roadmap for the additive manufacturing sector
Institution	Various
Good practice	By focussing on a particular sector, a roadmap could be designed which: • involved some 100 external (technical) experts. • was validated through a public online survey, collecting EU-wide feedback. • included priorities in both technical and non-technical domains.
Relevance for Flanders	Although the Skills Strategy Roadmap does not directly focus on green skills, relevant lessons can be learned since it is a roadmap that addressed skills issues and it was derived from a European-wide action.
Lessons or recommendations for Flanders	Initiatives at EU level that address the issue of green skills can be important gateways for national programmes and strategies. For specific sectors, Flanders can build on and learn from roadmaps developed at EU level and implemented in other Member States.

[45] Bundesministerium für Verkehr, Innovation und Technologie (2018). Roadmap zur Entwicklung des Feldes additive Fertigung (AF) Österreich mit industriellem Schwerpunkt

[46] AHS: university preparatory track at higher schools of general education (*Allgemeinbildende Höhere Schulen*, or AHS). An AHS, also known as a gymnasium, is an institution providing different fields of specialization that grant the diploma (*Reifeprüfung or Matura*) needed to enter university. Other than *Berufsbildende Höhere Schulen*, which also allows access to university, they do not provide graduates with any specific skill immediately useful on the labour market, but concentrate on general education in the humanities, science, and languages.

3 Vocational education and training

Most countries are involved in continuous development of their VET systems – of the system itself, curricula, occupational standards, apprenticeship systems etc. Their approaches, however, may differ. Whereas some countries develop their systems in response to demographic changes or changes in skills demands, others take a more practical approach, by involving the private sector in the development of new trainings courses or curricula.

3.1 Reforming the system

In this section, we present two cases where a more structural approach to reforming (or updating) the VET system have been implemented. In the first case (France), the path followed has been research followed up by conferences and platforms, resulting in new regulations. In the second case, (Finland), sustainability has been made an integral part of the education system, starting at kindergarten level.

France: Reform of the French VET system

In France, the law on energy transition for green growth (2015) marked a turning point in its energy and ecological transition. Simultaneously, the Parisot report (2019) [47] examined "under what conditions employment, training and professional development policies could be consistent and synergistic with the objectives set by the energy and ecological transition". In this perspective, the report broadens the issue of a transition seen in the light of eco-activities and green professions to a global transformation of all professions. Based on this report several public action instruments were mobilised, including the Skills Investment Plan 2018-2022, which finances efforts to transform skills and qualify the workforce in connection with the ecological transition. For its part, the "Climate and resilience" law (August 2021) includes a chapter II entitled "Adapting employment to the ecological transition", which promotes an evolution of the governance of employment at three levels: that of the business via the social and economic committees, that of the regions via the regional committees for employment, training and guidance and that of the branches via the operators of competences.[48]

Reforms of the French VET system initiated in May 2018 with an increased engagement of social partners in the development of curricula, and more room to "green" subjects and an expansion of apprenticeships to all vocational high schools. This was seen as a timely and relevant action, as training methods were not well tailored to the needs of the work force in the construction sector and the added value of existing courses was not always clear to this group.[49] These measures enhanced the prestige of VET, and contributed to improving the match between skills supply and demand and the students' transition to work. At post-secondary level, the vocational licences (level II, *Licence professionnelle*) now also include new licences related to the green economy, such as Eco-design. Here, professional branches play a central role in renewing qualifications or shaping new ones, particularly in the fields of

[47] French Ministry of Work, Employment and Integration (2019). *Plan de programmation des emplois et des compétences*, Report prepared by Mme Laurence Parisot.
[48] Source: Céreq Bref 2022/7. La transition écologique au travail: *emploi et formation face au défi environnemental*, Liza Baghioni, Nathalie Moncel.
[49] Source: Project Peer exchange green skills (February 2023): Narjisse Ben Moussa, Alliance Ville Emploi.

recovery, waste, energy and environment. Of the 95 existing trade and qualification campuses (*Campus des métiers et qualifications*), 11 specialise in energy and eco-industry transition.[50]

According to Baghioni and Moncel (*ibid.*), ecological transition not only raises the question of an increase in skills, but also of what new skills need to be developed. In this context, the Ministry of Agriculture and National Association for Vocational Training (Afpa)[51], began in 2014 to revise diplomas and professional titles, to assess the integration of environmental concerns into the content of training, similar to what the Ministry of National Education had done for the construction sector in 2007. In addition, based on the report of the Jean Jouzel commission released in February 2022[52], the French Ministry of Higher Education and Research announced the generalisation of teaching about the stakes of ecological transition and sustainable development in all higher education institutions. More specifically, on its website, the Ministry states that it is necessary to "boost the process and generalise to all students training related to ecological transition" and it lists four action points[53]:

1. training already available must be changed to include the stakes of ecological transition;
2. "teaching specific to the ecological transition" will be implemented in 2025 at the latest;
3. new courses will be available to offer training to new (social) enterprises working on ecological transition; and to reach this:
4. environmental issues must "overcome the contents of the training course and feed the overall strategy of institutions".

Much of the preparatory work on reforming the education system is done within the Onemev partnership steering committee, under the aegis of the Ministère de la Transition Écologique. Here expertise is exchanged on the monitoring and measurement of changes in jobs and skills, according to a multiplicity of points of view[54]. In particular, a series of webinars co-organised by Céreq, France Compétences and Onemev in the fall of 2020 on the theme "How to identify and support the development of skills in connection with the ecological transition?" allowed for discussions on the latest advances and the points of view of economic actors and educators on training systems[55].

Title	Skills Investment Plan
Country	France
Type of intervention	Research, laws and plans
Institutions	Various
Why is it a good practice?	The French approach to green skills is rather comprehensive and is supported by a number of (new) laws and policy measures. It also includes institutional reforms (such as establishing a Ministry of Ecological Transformation), with

[50] The campus of trades and qualifications ("CMQ") is a label making it possible to identify a network of general secondary , technological, vocational and higher education establishments, training organizations, research laboratories and economic and associative partners focused on specific courses and on a sector of activity corresponding to a national or regional economic issue.
[51] This agency was set up in 2017, and falls under both the Ministry of Work and the Ministry of Finance. It has an important role in the professional and social integration by supporting job seekers and employees, from training to employment: vocational integration; reskilling; upskilling; and personal, professional and career development.
[52] Source: https://www.enseignementsup-recherche.gouv.fr/fr/sensibiliser-et-former-aux-enjeux-de-la-transition-ecologique-dans-l-enseignement-superieur-83888
[53] *Ibid.*
[54] INSEE, DARES, DGEFP, Pôle Emploi, Céreq, France Stratégie, France Compétences, ADEME, CARIF OREF, AFPA, etc.
[55] France Stratégie, Céreq, ADEME, ministère de la Transition écologique et solidaire (2021) Identifier et accompagner les compétences de la transition écologique, synthèse du cycle 2020 de webconférences

Title	Skills Investment Plan
	multiple links to social partners and regionally based institutions, giving the country a firmly grounded institutional structure to address the issue. Changes were made to the secondary vocational pathway aimed at making the VET sector more attractive. This has been accompanied by the development of apprenticeships in all vocational schools, and by the gradual and guided transformation of low-inclusion streams and a renewed partnership with businesses to encourage the integration of young people. In addition, the Ministry of Agriculture and Afpa took the initiative to revise diplomas based on a continuous analysis of vacancies and consultation with experts and private sector representatives, to assess the integration of environmental concerns into the content of training. This was accompanied by measures to boost the process of ecological transition throughout the adaptation of educational system to include the topic of ecological transition.
Relevance for Flanders	In Flanders, ecological transition is recognised as a driving force for developing new (green) skills, and 'becoming more sustainable' is already accepted as a key competence in the curriculum of secondary education. However, actions in this domain can be more firmly grounded in the institutional educational framework adapted to this task.
Recommendations for Flanders	Flanders can benefit from a more holistic approach to ecological transformation where educational institutions are given a clear mandate to develop and implement curricula that integrate core aspects of the green transition. In terms of making VET more attractive and stimulating to the population to reskill and upskill to green skills, the following actions could be embedded in the Flemish VET system: regular revision of diplomas and certifications to ensure the availability of trainings for green skills; ensure apprenticeships are available to all schools and in particular for green occupations. To this end, partnerships between schools and businesses are to be encouraged.

Finland: Making the vocational education system greener and demand oriented

In Finland, a new national core curriculum for basic education was introduced for grades 1–6 in August 2016 as part of an overall reform of the education system[56]. Although general education is beyond the scope of this project, the Finnish case is included here as it illustrates the importance of early education efforts to the development of life skills that are important to the green transition in general and the efforts of VET institutes in particular. One of the fundamental values now embedded in the core curriculum is that the pupil is guided towards a sustainable way of life and understanding its importance. In addition, The knowledge and skills, as well as values and attitudes that promote these, run throughout the whole curriculum. In addition, there was a shift from a supply to a demand-orientated approach, which makes the education system – and vocational education in particular - more competence-based and customer-focused. This trend was reinforced through the vision document "The Finland we want by 2050"[57] which stated that sustainable development was to be integrated into education and lifelong learning, and also that educational materials would be developed to respond to

[56] Finnish National Board of Education (2014). New national core curriculum.
[57] YMPARISTO. Website: https://www.ymparisto.fi/.

the need for new skills and competencies. In the context of the Omnia Education Partnership[58] green skills are to be taught at vocational schools in collaboration with private companies. After a pilot that lasted 5 years and which involved some 120 vocational schools, a survey was taken which showed that 60% of respondents were now very familiar with green skills and SDGs as part of vocational training, and over 70% had integrated such skills into their studies. However, only 26% said it occurred in work-place learning.

Title	Making the vocational education system greener and demand oriented
Country	Finland
Type of intervention	Reform of the education system
Institution	Ministry of education and culture
Why is it a good practice?	Introducing sustainability as an integral part of education at an early age, and making green topics part of the teaching materials in vocational schools, are measures that will eventually stimulate the transition towards a workforce with green competences and skills. Encouraging curricula developers and schools to link-up with the private sector in order to better prepare students for the labour market.
Relevance for Flanders	Schools in Flanders are offered teaching materials to integrate SDGs into their curricula on a voluntary basis and the education system is seeking to strengthen links with the private sector.
Recommendations for Flanders	Give green topics (as part of the SDGs) a place similar to subjects such as writing and arithmetic to teach pupils and students how these concepts translate into other topics, particularly topics also promoted through the STEM agenda.

3.2 Linking up with the private sector (at local level)

In this section, we present four cases where the private sector has played an important role in developing new curricula, sometimes as a driving force (as in the Swedish case below), sometimes in a more indirect way.

Sweden: Collaborative upper-secondary VET system with private sector

In Sweden, where sustainability and green skills are traditionally an important subject in the education system[59], there is active collaboration between the formal education system and the private sector to foster up-skilling and re-skilling of the workforce. Since the school reform in 1989 and the introduction of a voucher system a few years later, manufacturing companies could (and did) become (part-)owners

[58] Omnia (1,000 staff, 35 000 students, yearly budget 85 M€.) is an joint education authority in the Espoo region of Finland which provides upper secondary vocational education and training and general upper secondary education, youth and adult workshops, further vocational qualifications and liberal adult education, vocational courses and support in recruitment for enterprises. Omnia established partnerships with 3000 companies and participates in the services of the regions' business and commerce.

[59] In Sweden, preschools, schools and adult education institutes have a remit to understand the requirements for sustainable development formulated in the Education Act, curricula and syllabuses. In-depth teaching on climate issues is common at the upper secondary level. Teaching manuals adapted for compulsory schooling and a wide variety of films and other teaching materials on climate issues and climate-friendly consumption, energy and transport are produced by government agencies and non-government actors. (Unesco, 2021. *Skills development and climate change action plans. Enhancing TVET's contribution*).

of schools,[60] either fully owned or co-owned with local governments. Around one-third of upper secondary schools in Sweden are now run by private firms, and about one quarter of the pupils at upper secondary schools are enrolled in privately owned schools. Both the Göteborg Tekniska College (see Chapter 6) and the two vocational schools[61] visited by the Flemish delegation in the context of this study, are examples of schools co-owned by companies and local governments.

Reforms of the Swedish upper-secondary vocational education and training (VET) system, carried out in the last decade, have enhanced work-based learning, established an apprenticeship system, put incentives in place to encourage local engagement with the social partners, and more recently, encouraged employers to pay apprentice wages, and to train workplace trainers so that they are adequately prepared to mentor workplace trainees and apprentices. As such, higher education institutions (HEI) have an important role in the Swedish innovation system and co-operate extensively with businesses, public authorities and civil society to promote sustainability, inclusiveness and innovation and virtually all HEIs have activities related to entrepreneurship education, including promoting lifelong learning. The following quote illustrates the flexibility within the Swedish education system:

> "There is a huge labour reform on the way. We are moving towards the Danish system which is very flexible. If you want to upskill and find a course [as an employee], you are allowed to do this. Employers will have to allow their employees to do trainings and cannot refuse the upskilling. They are moving to a system where it is up to the individual to take care of career development. There is a lot of funding in place for this. There is a very market based system for higher VET. When several companies see they are missing a skill in their employees, they can go to a higher VET school which cooperate with them to develop this skill. In this way the students graduating and the employers looking for workers can more easily be matched. About 90% of students find a job with this system." Pär Ludström - Swedish Installation Federation (Field visit to Göteburg, Sweden)

With an increasingly individually focussed education approach, often driven by business motives, the individual is now stimulated to find training that is attractive to him or her and commercially interesting for their employer. There are several organisations that guide employees in which skills are most future proof in terms of the green transition.[62] Moreover, guidance by counsellors is provided within adult education by the municipalities.

However, some challenges remain. The proportion of young people entering upper secondary VET has been falling[63], and the number of young people entering apprenticeships remained small, while local

[60] See Karlsson, T., F. Lundh Nilsson, and A. Nilsson. 2015. "Modern Apprenticeship and Teknikcollege: Historical Roots of Two Current Features of Swedish Vocational 18 B. PERSSON AND B. HERMELIN Education." In History of Vocational Education and Training in Europe: Cases, Concepts and Challenges, edited by E. Berner and P. Gonon, 367–384. Bern: Peter Lang.

[61] In Bräckegymnasiet the curriculum is based on workplace learning for construction (e.g. carpenter, painter, metal worker, builder, land construction, etc), this technical high school transmits also transversal and soft skills. Students are 15-16 year old when they enrol and come from various backgrounds. After 3 years of VET, students (between 20 to 40 years old) have three more years of employment as apprentice. YRGO is a polytechnic, post-secondary form of education, which develops and runs all educations together with industry companies and public organizations. In this way, the content of the curriculum is to match the skills needs existing in the labour market. More than 9 out of 10 who study a polytechnic education have a job in the relevant vocational area six months after graduation. They are trained to become the site managers in the construction sector.

[62] The Security Fund (TSL) and The Safety Council (TRR)

[63] The percentage of students on the national programs studying a vocational education has dropped from around 45 percent in the academic year 2008–2009 to around 30 percent in 2022. Source: https://www.svensktnaringsliv.se/sakomraden/utbildning/framtidens-yrkesutbildning-ge-branscherna-makten_1179966.html

engagement of the social partners in the VET system remains patchy. In addition, the Swedish VET system also faces new challenges in responding to an increasingly diverse cohort of learners.[64]

Title	Collaborative upper-secondary VET system with private sector
Country	Sweden
Type of intervention	Reform of VET system
Institution	Diverse actors in the VET system and private actors
Why is it a good practice?	The link between the private sector and (vocational) schools allows curricula to be updated on a more regular basis, to offer training on a flexible basis, so the educational system is more focussed on future proof skills including green skills.
Relevance for Flanders	In Belgium, initiatives exist to boost awareness of green issues across the educational system, such as setting up a taskforce 'climate and education'.[65] Under the STEM agenda, it is recognised that vocational education curricula should be reviewed to include more green and circular topics.[66] In the Belgium education system, financing of schools by private companies is rare and even VOKA, the Flemish association of enterprises, does not go further than asking for better cooperation between the private sector and the education system.[67]
Recommendations for Flanders	Ensure that the interaction between the private sector and education sector is more focused on green skills and couple this with a more flexible system of adapting curricula to bridge the gap between the skills taught at schools and those needed by the sector as a result of the green transition.

Denmark: New VET programmes developed at local level

In Denmark, new VET programmes have been developed to reflect the demand for new green skills, such as training for wind turbine operators in 2010 and environmental technologists in 2013. The Danish vocational education and training system has, through a series of reforms since 2000, given increasing autonomy to the local level to adapt course curricula to labour market needs through outcome and competency-based goals without detailed proscriptive curriculum requirements. In the new national structure for continuing vocational education and training provision, thirteen CVET competency centres have been formed to connect providers of CVET and basic adult education in a more transparent infrastructure. Those centres are also responsible for anticipating and monitoring skills changes at the local level. The reform has also instigated a standardisation of initial vocation education and training (IVET) qualifications and CVET labour market certifications, so that CVET certifications can be integrated in IVET programmes and count towards credits in IVET.

Title	New VET programmes developed at local level
Country	Denmark
Type of intervention	Local centres for curriculum VET development
Institution	CVET competency centres

[64] OECD (2019). Vocational Education and Training in Sweden.
[65] Vlaamse Overheid (2021). Vlaams Energie en Klimaat Plan.
[66] Vlaamse Regering (n.d.). STEM-agenda 2020: STEM-competenties voor een toekomst- en missiegericht beleid.
[67] Voka (2022). Naar een ondernemend onderwijs. Hoe scholen en ondernemingen elkaar sterker kunnen maken.

Title	New VET programmes developed at local level
Why is it a good practice?	New TVET programmes have been developed to reflect the demand for new skills. CVET competency centres have been given the role of developing curricula for IVET and CVET based on local needs for (green) skills (without detailed proscriptive curriculum requirements).
Relevance for Flanders	Although there are so-called "Regional Technological Centres" (RTCs) in the Flemish provinces, they have no role in coordinating the STEM strategy or other curriculum related issues
Recommendations for Flanders	Let regional centres (either RTCs or other regional bodies) play a more important role in linking VET schools to needs of the private sector, by stimulating their coordination through regional initiatives.

Ireland: Education Training Boards and green skill related initiatives

Like other EU countries, the Irish construction sector is faced with various issues that inhibit the development of a modern and sustainable sector. This includes, among others an aging profile of construction workers, SMEs that lack time and resources to upgrade their workforce, low pay for apprenticeships, and the onerous nature of government grants.[68] Education Training Boards[69] have assumed responsibility for the network of local training centres to respond to skill needs in a flexible way. This has brought with it a strong network of local employer links, a system for contracting training provision and expertise in a wide range of specific skill areas. This also provides opportunities to manage education and training provision in a co-ordinated way, with a broader range of programmes to meet the skills requirements of the local and regional economy. In addition, the Skillnets model[70] enables networks of employers in regions or sectors to come together to determine their common skill needs and procure training for their employees. Other skills related initiatives in Ireland include:

- Springboard+: a key part of the upskilling and reskilling ecosystem in Ireland, it has an important part to play in developing skills for the zero-carbon economy, particularly from the perspective of upskilling and reskilling those in engineering and scientific sectors.
- Green-Schools (*An Taisce*) is Ireland's leading environmental management and education programme for schools operating in nearly all schools nationwide. The Green-Schools programme is fostering environmental awareness and action in schools and their wider communities.
- Net-Zero Energy Building (nZEB) - Centres of Excellence for Green Building skills were established after the introduction of nZEB standards in Ireland, to assist the upskilling process of the construction industry. In 2020, the Irish Government allocated €500,000 to expand the skills development infrastructure in preparation for the significant increase in reskilling required to deliver the National Retrofitting Programme.

Title	Education Training Boards and green skill related initiatives
Country	Ireland

[68] Project peer exchange green skills (February 2023), presentation by Gloria Callinan (Technological University of the Shannon, Ireland).
[69] An Education and Training Board (ETB) (Irish: Bord Oideachais agus Oiliúna) is a statutory local education body that deliver a wide range of education services. ETBs manage a large number of secondary schools, further education colleges and training centres, multi-faith primary schools and adult education centres throughout the country. They deliver a growing number of apprenticeships and traineeships across the State.
[70] Skillnet Ireland. Website: Transforming Business Through Talent.

Title	Education Training Boards and green skill related initiatives
Type of intervention	Devolving education to local initiatives
Institution	Local Education Training Boards
Why is it a good practice?	Giving local bodies statutory powers for managing education and training, makes it possible to set up effective (local) networks with social partners. A number of skills related initiatives are implemented to boost the skills of the present and future workforce. The introduction of nZEB standards in Ireland, set off an upskilling process within the construction industry leading to setting up a "Centre of Excellence for Green Building Skills".
Relevance for Flanders	Some measure of devolving education management powers to local level bodies can enhance the responsiveness and relevance of VET schools. There are few initiatives in Flanders specifically aimed at VET schools that enhance the green skills for (future) workers in the various sectors.
Recommendations for Flanders	Devolve (some) powers to local bodies which can liaise more effectively with social partners (both private sector and NGOs). Explore the specific measures for enhancing green skills' in Ireland in more detail for additional features relevant to Flanders

Spain: Responding to demands of the local private sector

In Spain, updated and new TVET diplomas with skills for green jobs have been developed over the last 10 years, partly as a result of private sector demands. An example is the cluster of automotive companies in the Castilla y León region, who were able to persuade the regional government to invest in a higher automotive technician diploma.[71] Between 2009 and 2016, the number of employees who received training for the green transition under this system doubled from 30,382 to 61,984.[72] SMEs tend to face greater barriers in accessing the system, due to their lack of necessary knowledge, the administrative burden involved and their lack of trust in the system. In order to lower these barriers, the State Foundation for Training for Employment (Fundae) and the Spanish Confederation of Employers' Organisations (CEOE) organise guidance workshops and provide other assistance to SMEs.

Title	Response to local private sector demands
Country	Spain
Type of intervention	Local sponsorship of TVET training
Institution	Fundae and others
Why is it a good practice?	SMEs in Spain (as in other countries) often face barriers in accessing subsidy schemes, due to a lack of necessary knowledge, the administrative burden, and a lack of trust in the system. In order to lower these barriers, the State Foundation for Training for Employment and the Spanish Confederation of Employers' Organisations organise guidance workshops.
Relevance for Flanders	In Flanders, initiatives to include green competences in the existing VET courses mostly come from government supported platforms or steering groups (such as STEM platform, *Moonshot*, *Competent*, etc, whereas large (international)

[71] Cedefop 2019. Skills for Green jobs, 2018 update.
[72] *Ibid.*

Title	Response to local private sector demands
	companies design in-house courses (see chapter 6). The so-called *Talentenwerf* (Talent Yard), an initiative of the city of Antwerp comes close to the Spanish approach. Here, a partnership of the VDAB, the municipality of Antwerp, the Antwerp education council and the Fund for Vocational Training in the Construction Industry (FVB) brings together personnel and know-how to create a "one-stop-shop" for construction companies, their employees, job seekers and local schools and much attention is paid to the development of innovative training programs with the highest possible contribution from employers.
Recommendations for Flanders	Provide room for the private sector to formulate (and fund) their demands in terms of updating VET courses and curricula to include (new) green skills for their employees.

4 Public Employment Services

In this chapter we focus on the dual role of Public Employment Services (PES): monitoring, analysing, and forecasting of employment trends and the associated skills requirements, and their active involvement in identifying employment opportunities and skills gaps. According to the European PES Network, challenges for PES regarding the green transition are:[73]

- Grasping the structural changes associated with the green transition;
- Identifying skills needs as well as transferability of skills across sectors and occupations;
- Mitigating negative employment effects especially for sectors with risk of skills mismatches;
- Designing tailored solutions for older workers overrepresented in the polluting industries and concentrated in certain geographical locations;
- Ensuring the green transition is embraced by all, including women who are under-represented in new sustainable jobs as well as regarding advanced digital and technical skills;
- Endowing low-skilled workers with technical and generic skills relevant for the green economy;
- Providing vocational guidance for adults, with a special support for SMEs.

This chapter will look at some initiatives of PES in the EU that can be considered as case studies with relevance to the situation in Flanders. On the basis of these case studies, recommendations will be made for the Flemish system of employment services with relations to green skills development and green jobs. The chapter is structured as follows, Section 4.1 focuses on the services of analysing and forecasting skills needs and employment dynamics. Then, Section 4.2 gathers good practices with regards to combining training and employment activities within a PES. Finally, conclusions will be drawn on the services of PES and the related recommendations for Flanders (Section 4.3).

One important aspect to note is that in Flanders, the Public Employment Service is the Flemish Service for Employment and Vocational Training (VDAB). This governmental agency is governed by the Department of Work and Social Economy and has the purpose of aligning labour market demand and supply by mediating the market and guiding job seekers to employment. One of its core tasks is also ensuring job seekers are prepared for the labour market demands and thus to ensure they receive appropriate trainings. The VDAB thus facilitates the access for job seekers to training and even provide training themselves. In short, the VDAB fulfils a dual role both on the demand side and supply side of the labour market.

4.1 Public Employment Services: Analysis and forecasting

In this section, the tasks of Public Employment Services of analysing and forecasting trends in green jobs and skills are discussed. The cases are mainly drawn from two studies: one on good practice of PES activities in a number of EU countries published in 2021 by the Commission[74], and another on organisations working on forecasting, written by four research institutes.[75] It is important to note here that there are also several international organisations involved in the analysis and forecasting of green jobs and skills, such as Cedefop, OECD and ILO.

[73] Based on presentation of Nicola Duell, PES Network Management Board Meeting, 24 June 2021.
[74] European Commission (2021). Greening of the labour market – impacts for the Public Employment Services.
[75] Labour Market Anticipation: Lessons from around the world (2016), Wilson, Czesana, Simova, Kriechel, Vetter

France: Pôle Emploi and other dedicated institutions

One of the basic tasks of the French Public Employment Office (Pôle Emploi), is to analyse the structural changes associated with a transition towards a green economy, which involves the definition of green occupations and greening occupations and identification of the strategic sectors affected by the green economy: mainly agriculture, forestry, fisheries, (sectors not considered as a priority for the green transition in Flanders), and energy, resource-intensive manufacturing, recycling, construction, and transport.[76] This work allows Pôle Emploi to make improvements in its placement activities and brings its training programmes in line with the requirements of the green transition. It also provides relevant information for career advice and vocational guidance services.

Besides Pôle Emploi, there are a number of other organisations in France which are involved in the analysis of the labour market and skills needs, one of which is Afpa.[77] Over the last 10 years, Afpa has increasingly offered services to deal with the green transition. Their mission is to analyse jobs and competences based on impacts of changes, including from the energy, ecological and sustainable development transitions. Afpa has developed a system where they review and analyse all certifications and curricula in France every 5 years and make changes where needed, and they are responsible for certifying training diplomas which are much shorter than initial education and directed towards adults and professionals.

France also has an observatory dedicated to the green economy, green jobs and skills. The organisation is called Onemev and has no equivalent in other European countries.[78] The observatory members include representatives from the Ministry of Ecology Environment (*le Commissariat Général au Développement Durable*), the National Statistics Office (Insee), public employment services, research units and institutions (for example Dares or Céreq), a few public institutions in charge of adult education as well as representatives of the regional observatories on employment and training. It organised a series of consultations with representatives from sectors affected by the green transition between 2012 and 2015. However, according to the OECD, those consultations should be held more regularly or other methods should be developed to follow progress in real time.[79]

At regional level, observatories for employment and training (Oref) regularly publish studies on green jobs and skill needs, which contribute to building regional strategies. The regions are also able to work with the professional branches, the social partners and local authorities to build a training offer adapted to economic needs. An example of regional cooperation on green skills in France, the ECECLI project (*Evolution des compétences emploi climat* Ile-de-France, 2012-2014, part-funded by the EU) focused on the ecological and energy transition in the Greater Paris area. Working together, regional representatives of the Ministries of Employment and Ecology, the regional authorities, and the Seine Normandie Water Agency identified the evolution of skills in 35 professions. These included emerging professions (such as ecologists specialised in the restoration of natural environments; eco-mediators for sorting waste and energy efficiency) and professions subject to transformations (such as bus drivers who will have to master eco-driving as well as computerised vehicles, and site managers in construction who will have to organise the sorting of waste materials).[80]

[76] Pôle Emploi. Website: Les métiers verts.
[77] Information presented here was shared by Afpa during the study visit in June 2022.
[78] International Labour Organisation (2018). World Employment Social Outlook 2018 - Greening with jobs.
[79] Source: https://www.oecd-ilibrary.org/sites/2f1e8fcd-en/index.html?itemId=/content/component/2f1e8fcd-en
[80] Cedefop (2018). Skills for green job in France: an update.

Title	Pôle Emploi
Country	France
Type of intervention	Research (skills forecasting & analysis)
Institution	Institutions for observing, analysing and forecasting skills and jobs
Why is it a good practice?	Analysing the structural changes associated with a transition towards a green economy, which involves defining green occupations and greening occupations was established as one of the core activities of Pôle Emploi. This facilitates the alignment of the labour market with the requirements of the green transition. Additionally, Pôle Emploi was able to identify the sectors which will be most impacted by the green transition. This not only guides their employment related activities but can also provide a basis for policy-makers to direct further skills developments towards where they are most needed.
Relevance for Flanders	The mandate of Flanders' Pubic Employment Office (VDAB) is similar to the Pôle Emploi in many aspects, and its work on skills forecasting (including the development of competence frameworks) is well developed. It is therefore well-placed to take up the challenge of stimulating the labour market towards the green transition.
Recommendations for Flanders	VDAB is in a good position to strengthen its focus on the green transition, and developing training and advice services similar to Pôle Emploi.

Germany: Long-term and regional forecasting of skills

In Germany, there are a wide range of actors and initiatives that contribute to, or generate, skills forecasting or labour market intelligence. A few initiatives provide regular and comprehensive skills forecasting. These include the BiBB/IAB forecast, which was initiated about fifteen years ago, and the Economix/IER/CE forecast of the German labour market carried out on behalf of the Ministry of Labour and Social Affairs (MLSA). Those long-term, regular and comprehensive forecasts are carried out on behalf of public authorities by independent research organisations and are used primarily to inform the commissioning organisations' strategic planning. Sub-national forecasting – commissioned by regional bodies at the 'Bundesländer' or regional level – is another feature of the German system. This focus on a regional approach reflects the federal structure of Germany. Information on occupational profiles and skills requirements as well as educational training, including from identified green occupations is available at BERUFE.NET. This is an online career advice portal of the Federal employment agency that contains information on future trends in several individual occupations. It uses labour market information from different sources (research institutes, federal offices and ministries, chambers, associations). This database includes green jobs.

Title	Long-term and regional forecasting of skills
Country	Germany
Type of intervention	Research (skills forecasting & analysis)
Institution	Ministry of Labour and Social Affairs, regions ('Bündeslander'), Federal Employment Service

Title	Long-term and regional forecasting of skills
Why is it a good practice?	Germany has long-term, regular and comprehensive skills forecasts which are carried out on behalf of public authorities by independent research organisations and are used primarily to inform the commissioning organisations' strategic planning. Sub-national forecasting is done by independent organisations commissioned by regional bodies to gather information on occupational profiles and skills requirements. On both levels, green jobs and skills are included in the analysis and forecasting exercises. Thereby, the country's PES and active labour market programmes have played a role in supporting the green transition and economic restructuring in specific regions, including in the energy sector and energy intensive industries.
Relevance for Flanders	In Flanders, a large skills forecasting exercise is done periodically with the support of ESF, called "SCOPE". The aim is to assist recognised organisations (representing sectors or a cluster of companies) with strategic forecasting of competences. This has led to eleven so-called focus studies (2017-2019) from innovative business networks and spearhead clusters where they established the impact of digitalisation, automation and other trends on competences and jobs specific for their sectors and activities.[81]
Recommendations for Flanders	Continue with the SCOPE study as a major source of information on skills gaps and forecasting. Consider expanding the SCOPE exercise to all Flemish sectors and including a dedicated segment on green skills.

Spain: Observatory of Occupations and National Qualifications Institute

In Spain, the incorporation of green skills into general forecasting systems is achieved in various ways. Skills forecasting is part of the work of parallel processes, led by different authorities covering employment and education:

1. The Observatory of Occupations (*Observatorio de las ocupaciones*) which is overseen by the central public employment service and analyses around 200 selected rapidly growing occupations each year. Skill gaps relevant to these occupations are analysed by groups in the regional network of the observatory. Several green occupations have been studied. Fundae, the State Foundation for Training for Employment (*Fundación estatal para la formación para el empleo*), is responsible for lifelong learning for employed workers; it also leads a scheme for forecasting and planning skill demands and the organisation of the skills response through studies and research.
2. On the education side, the National Qualifications Institute (INCUAL) monitors the evolution of professions (mainly through the Observatory of Professions, a department within INCUAL) and defines training responses to the skill gaps identified. INCUAL, although under the remit of the Ministry of Education, is also the technical body of the General Council of Vocational Training, which gathers together representatives from central and regional governments, as well as from social partners, but is governed by the Ministry of Employment and Social Security. Interventions targeted at green skills can also be implemented by governmental administrations outside the employment arena, although examples of this are rare. Several small initiatives in Spain are under the Office of Climate Change (*Oficina Española de Cambio Climático*, OECC, embedded in the Ministry of Environment), such as the development of

[81] Vlaamse Regering. Website: Kennisplatform Departement Werk en Sociale Economie.

training materials for VET programmes of forest agents, the coordination of research projects on the greening of sectors and subsequent dissemination of results, and providing expert support and guidance to training programmes organised by other bodies.

Title	Observatory of Occupations and National Qualifications Institute
Country	Spain
Type of intervention	Research (skills forecasting & analysis)
Institution	Observatory of Occupations, the State Foundation for Training for Employment, National Qualifications Institute, Office of Climate Change)
Why is it a good practice?	Two separate organisations are responsible for monitoring of occupations and the skills these require and monitoring of available qualifications and trainings to identify skills gaps. Both organisations are specialised in monitoring their side of the labour market (supply vs. demand) and then use the other's analysis to optimise their activities in the sectors or occupations that need it. Interventions targeted at green skills can also be implemented by governmental administrations outside the employment arena.
Relevance for Flanders	In Flanders, one of the main tools for observing and monitoring the labour market is the Competent database, originally developed by the Social and Economic Council of Flanders and currently managed and used by the VDAB. Here, professional competency profiles are written out, describing which activities are performed in professional contexts and what someone needs to know, and be able to do, in order to adequately carry out the activities. Employees and job seekers can use the information in Competent to gain an initial idea of the possibilities in the job market. It is used by VDAB to match jobseekers with vacancies based on skills requirements, in addition to the traditional qualification and work experience requirements.[82]
Recommendations for Flanders	The monitoring of jobs and required skills is a well-established practice in Flanders. Although, the next step is to ensure that the monitoring of both the demand and supply side of the labour market are not stuck in their silos and can use each other's work to optimise their activities in the sectors or occupations that need it.

Netherlands: Research Centre for Education and the Labour Market

In the Netherlands, there has been a long tradition of economic forecasting in general, but also skills forecasting. The Dutch Bureau for Policy Analysis ('Centraal Planbureau'), established in 1945, has, for many years, analysed the effects of current and future government policies on the labour market. The focus of its research was on the macroeconomic effects of policy, forecasting, and policy evaluation. While funded by the Ministry of Economic Affairs (MEA), it is still deemed as independent. It also publishes reports on labour market issues, yet without formally and regularly modelling detailed skills forecasts. The predominant player in labour market and skills anticipation, the Research Centre for Education and the Labour Market (ROA) based at Maastricht University, performs sector studies and has developed a periodically updated skills forecast. Another important skill forecast is performed by the Dutch Public employment services '*UWV Werkbedrijf*' (PES). While it is less elaborate and detailed than

[82] VDAB. Website: Beroependatabank Competent.

the one carried out by ROA, it plays an important role in allowing the PES to understand labour market trends.

Title	Research Centre for Education and the Labour Market
Country	Netherlands
Type of intervention	Research (skills forecasting & analysis)
Institution	Dutch Bureau for Policy Analysis, the Research Centre for Education and the Labour Market, the Dutch PES (UWV)
Why is it a good practice?	The process of combining analysis of skills, qualifications and occupations within a single independent institute has proven successful in nurturing the build-up of organisational knowledge within that institute, but also in recognition of the independence and reliability of the results in the rest of the country. While the institute (ROA) is not able to provide all relevant research and output on this topic and depends on information from other organisations, it has allowed the build-up of a critical mass of research and people involved which would otherwise be hard to finance in an economically medium sized country. More recently, there has, however, been a tendency towards more tender based studies, which spread the financial resources more widely (and thinly) at the cost of less focussed and integrated research agendas.
Relevance for Flanders	A general recommendation is to ensure that the analysis of skills, qualifications and occupations can be embedded in the core activities of a PES. This proves to be more financially beneficial than for instance using a tender process each time a study on forecasting needs to be done. In Flanders, these activities are already well-established within the VDAB or long-standing studies in other organisations (e.g. SCOPE from ESF).
Recommendations for Flanders	Keep the analysis of skills, qualifications and occupations embedded in the activities of established organisations to avoid having to work with a tender-based study system.

4.2 Public Employment Services: Combining training and employment

In addition to skills forecasting and analysis, as discussed in the previous section, PES are also responsible for facilitating the access to the labour market for population groups such as the unemployed, graduates, people who want to change careers, etc. Following the latter objective, they offer training or stimulate their development by highlighting these skills shortages and the changes needed to curricula and the training offered. This is the case for skills needed for the green transition, but also for broader skills shortages. The VDAB in Flanders is already quite adept in performing these different tasks.

France: Guiding the unemployed towards green jobs

In France, Pôle Emploi's agencies play a role at the local level in identifying promising sectors and occupations, by identifying recycling and sustainable building jobs, and matching them with jobseekers. It has developed workshops to provide potential employees with the most up-to-date information. Where immediate routing into employment is not possible, Pôle Emploi guides people to individual training or internships in companies. In the Hauts-de-France region, it was recognised in 2016 that 400

new jobs would be needed in the wind power sector by 2020[83], which is why the regional authorities and the Pôle Emploi directed job seekers towards specialised training in wind turbine maintenance. In line with the strategic plan of Pôle Emploi and governmental measures related to Sustainable Development, the French PES also offers online training on green and greening occupations for its own staff. In addition to the Pôle Emploi, the National Agency for the Ecological Transition (Ademe) has set up a number of initiatives in cooperation with the local 'jobs houses' (*maisons de l'emploi*[84]), Alliance Ville Emploi, chambers of commerce and other actors. This regional approach is important, given the large size of the country and the experience that the national labour market does not operate as a perfect market, due to some viscosity ("people don't easily look for a job on the other side of the country").[85] Activities include skills analysis and skills anticipation for a greener labour market[86] and awareness raising activities.[87] It also supports activities of the PES for placing long-term unemployed people into sustainability projects (in the context of the French programme *Territoires Zero chômeur longue durée*).[88] Pôle Emploi also sets incentives for PES staff to implement and to show cases of innovative practices in supporting the green transition. Although France recognises the need to decarbonise at the national level, it is difficult to translate this ambition to the level of small towns.[89]

For instance, Alliance Ville Emploi (AVE) mentioned during the study visit that energy policies under the French Climate Law introduced stimulation measures to increase the number of installed heat pumps. However, AVE calculated that to install and maintain the desired number of heat pumps in France to reach their energy targets, this would require approximately 10 000 additional skilled workers. Currently, these workers do not exist and thus new workers will need to be attracted and trained. However, this will take too long to reach the targets within the established time frame by the Climate Law.

Title	Guiding the unemployed towards green jobs
Country	France
Type of intervention	Training programmes to incentivise employment focused on labour market demand
Institution	Pôle Emploi, ADEME and Allliance Ville Emploi
Why is it a good practice?	Through different initiatives and activities of the French PES, it was discovered that when it came to guiding the unemployed to the labour market, a regional approach worked best. One of the reasons for this is a that given the large size of the French territory, it is unlikely that people will search for or accept a job in a different region.

[83] Ademe (2020). Economie circulaire et emplois en Hauts-de-France. Ademe (2020). Economie circulaire et emplois en Hauts-de-France.
[84] Ademe (2012). Projet «Maisons de l'emploi et développement durable» : capitalisation des plans d'action. Ademe (2014). Transition énergétique : Les territoires se mobilisent et accompagnent l'évolution emplois et des compétences dans la filière du bâtiment.
[85] Source; interview Alliance Ville Emploi, 9/9/2021.
[86] See for example: Ademe (2020). Economie circulaire et emplois en Hauts-de-France; Ademe (2020). Impact sur l'emploi et l'économie de la transition énergétique en Grand Est; Ademe (2019). Marchés et emplois liés aux filières ENR&R dans les territoires impactés par la fermeture d'une centrale à charbon. See for example: Ademe (2020). Economie circulaire et emplois en Hauts-de-France; Ademe (2020). Impact sur l'emploi et l'économie de la transition énergétique en Grand Est; Ademe (2019). Marchés et emplois liés aux filières ENR&R dans les territoires impactés par la fermeture d'une centrale à charbon.
[87] Ademe en Bretagne. Website: Métiers de la transition écologique et énergétique. Ademe en Bretagne. Website: Métiers de la transition écologique et énergétique.
[88] Source: https:/www.youtube.com/watch?v=xLspaQU2vlM&feature=emb_title.
[89] Source: Interview Alliance Ville Emploi, 9/9/2021.

Title	Guiding the unemployed towards green jobs
Relevance for Flanders	Given the small geographical size of Flanders, a regional approach does not seem immediately necessary. However, the institutional framework in which Belgium operates does not always make it easy to align policies across the different regions and the same goes for the territories within Flanders. The implementation of Flemish policies on a local level with regards to solving green skills shortages is not always straightforward, due to the demographic differences.
Recommendations for Flanders	The VDAB possesses regional and local offices and training centres which ensure their activities can be tailored to the local context and demography.

Luxembourg: Fit4Green&Build Jobs

In Luxembourg, the 'Fit4Green&Build Jobs' is an example of a combined training and employment initiative to incentivise young unemployed people between 18-29 to move into green jobs in the construction sector.[90] This project was developed to support the development of the construction sector and support sustainable professional integration. It was launched in 2015 for an initial period of 30 months, and the practice was extended in 2018 to the end of 2020. They benefitted from various training courses related to the construction sector. Upon finalising the training, the trainee was awarded a contract as an assistant worker within companies that were part of the training programme. The contract was subsidised up to 50% of the salary for 12 months, with the aim that the trainee would be offered a full-time contract after this period.

Title	Fit4Green&Build Jobs
Country	Luxembourg
Type of intervention	Training programmes to incentivise employment focused on labour market demand
Institution	The Employment Development Agency (ADEM) and the Building Sectoral Training Institute (IFSB) with the support of the ESF
Why is it a good practice?	This combined training and employment incentive measure shows that it is possible to attract the group of young unemployed and stimulate them to work in the construction sector. Young people who participate in this programme did not simply receive training in green and non-green skills, but were also assured of a traineeship position. Subsidies were used to stimulate companies to afterwards give a permanent position to the trainees. This created security and perspective on both sides and increased the success rate of the programme.
Relevance for Flanders	The construction sector in Flanders is one of the sectors which will undergo a large impact from the green transition, but it is already facing the challenge of labour and skills shortages.
Recommendations for Flanders	Providing financial incentives to employers active in greening the construction sector to employ trainees and also provide them with permanent jobs afterwards could help solve the already critical labour shortages in the sector and stimulate the green transition at the same time. This approach could be expanded to other sectors as well.

[90] Source: www.fit4greenjobs.lu/

Slovenia: Green Jobs

In Slovenia, in the context of government's strategy towards greening the economy, a new employment incentive called "Green Jobs" was introduced as a pilot measure. The target for 2021 was to include around 200 unemployed people in this measure in order to be hired in green jobs. The employment subsidies amounted to around EUR 340 per month (relatively high compared to other subsidies granted in Slovenia). The subsidy was paid to employers who hired unemployed workers on a permanent employment contract for two years. The employers had to fulfil some criteria to receive the subsidies in addition to the usual criteria, which related to occupations, sectors, certificates connected to the green jobs/sector/activity.

Title	Green Jobs
Country	Slovenia
Type of intervention	Programme to incentivise employment focused on labour market demand
Institution	Financed by the Ministry of Environment through the climate change fund
Why is it a good practice?	This initiative shows that employment incentives can also combine the objective of bringing disadvantaged groups into employment (the traditional work of a PES) and promoting the transition to greening the economy.
Relevance for Flanders	In Flanders, initiatives to promote green jobs exist, but are mainly focused on raising awareness. One example is the Green jobs project from *Arbeid & Milieu vzw* which encourages the transition towards new green jobs and the greening of existing jobs, primarily through awareness raising campaigns.[91]
Recommendations for Flanders	Initiatives on green jobs could be tailored to the target group of unemployed to address two issues at the same time. There is more space in governmental initiatives to promote green jobs in a more profound way than simply raising awareness through the VDAB or other actors. This can be done by providing financial incentives to employers active in greening the economy to employ trainees and also provide them with permanent jobs afterwards.

Sweden: Green jobs for nature

In Sweden, the "Green jobs for nature" initiative[92] targeted unemployed people and offered them trainings in occupations in green industries facing shortages. At the same time, they promoted outdoor activities, cultural heritage, recreation, and tourism. The initiative covered the entire country. During the field trip visit to the Swedish PES, this example was the only one that was directly related to green skills, which are not (yet) a priority for the PES.[93] The challenge is that the work of PES is based on the individual, which makes it difficult to come with an institutionalised approach targeting certain stakeholder organisations. This would require collaboration and a dialogue with the Business Regions, and requires information on who is responsible for what type of education. Currently, policies on skills for the green transition are initiated at the federal level only.

Title	Green jobs for nature
Country	Sweden

[91] MVO Vlaanderen. Website: Arbeid & Milieu vzw.
[92] Government Offices of Sweden (n.d.). Green jobs for nature across the country.
[93] Green elements are also not appearing yet in the skills forecast.

Title	Green jobs for nature
Type of intervention	Initiative on green jobs
Institutions	Swedish Forest Agency, Geological Survey of Sweden, Swedish Environmental Protection Agency, county administrative boards and Swedish Public Employment Service
Why is it a good practice?	There are several initiatives ongoing in Sweden to promote green jobs and address regional skills shortages. However, there is a recognition within the PES that more could be done to explore the jobs and skills demand and anticipate the needs of the green transition.
Relevance for Flanders	Supporting people far removed from the labour market is (partly) the mandate of the OCMW (Openbaar Centrum voor Maatschappelijk Welzijn).
Recommendations for Flanders	Promote social inclusion by seeking job opportunities for those far removed from the labour market in green jobs.

5 Governance and stakeholders

As we saw in Chapter two on strategies, policies and roadmaps, the design and implementation of green skills policies takes place at various levels of government, often in consultation with a wide variety of stakeholders from the private sector and civil society. In this chapter, we discuss the processes and interactions between these stakeholders as they jointly work to mitigate the shortages of green skills.

As seen in the previous report on Green Skills needs in Flanders, Flemish institutions and stakeholders are quite active in this field and a number of initiatives such as *Vlaanderen Circulair* are already ongoing. However, further mobilisation, particularly for the construction, energy and manufacturing sectors is needed to address the green skills challenge. Whilst sector specific technical skills will remain an issue, the largest needs are identified in lifelong learning and STEM skills, alongside upskilling on professional and cross-cutting skills for the green transition.

5.1 Governance structures

In this section we highlight the importance of governance in relation to the efforts of private sector actors, governments and educational institutions to address the issue of green skills using the example of Gothenburg (Sweden) and of Northern Jutland (Denmark). In both cases, it is not only the actions of individual stakeholders that determine progress in this area, but also the way in which they interact with each other, the type of agreements made and the roles they each play.

Sweden: Region of Gothenburg

The study visit to Gothenburg (Sweden) gave a good insight in the way in which different stakeholders in the region interact on topics such as economic development and skills. To coordinate the different interests of stakeholders, Gothenburg Region[94] has set up a network driven organisation bringing together 13 municipalities with a mandate to increase the welfare of the region's inhabitants. Among others, it functions as a collaborative body in the labour market, environment and community building, social welfare including municipal health care, education and business.

The Region of Gothenburg also runs a business unit: "Business Region Gothenburg" which has as its objectives to make Gothenburg a European metropolitan region that: i) is best at retaining competence and attracting talent; ii) offers best preconditions for high and sustainable growth; and iii) has the best climate for entrepreneurship and innovation. It has defined the creation of 120 000 new jobs by 2035 as a quantitative target. Focus areas relevant to the green transition are:

- Develop school-entrepreneurial collaboration throughout the entire education system.
- Develop possibility for VET and lifelong learning at working places.
- Enable better matchmaking and faster validation of (green) skills.

Another example of the work by the Region of Gothenburg is the planned investment by Nothvolt - in collaboration with Volvo Cars - to establish a new battery factory with 3 500 employees. In view of the demand for new skills related to battery technology there is an urgent need to attract talent)[95]. Together with the City and commercial partners, the Region is taking measures - among others:

[94] The Gothenburg Region (GR) is a municipal association, which functions as an authority on behalf of the municipalities in some areas.
[95] Source: Interview with Gothenburg Region.

- To establish a Training Centre;
- To set up an international house – meeting place for international talents. It is designed to offer activities, services and guidance for an easy integration into Swedish society. Furthermore, it offers advisory to incoming talents before arrival, and it provides tools, services and activities that support talent in their settlement process; and
- To establish an international school.

Title	Region of Gothenburg
Country	Sweden
Type of intervention	Collaboration between the Region, education and business for the following activities: developing trainings, possibilities for VET and lifelong learning at the work place, enabling better matchmaking between employers and employees, attracting (international) talent.
Institution	Region of Gothenburg
Why is it a good practice?	The region of Gothenburg through several initiatives has shown that the following actions at a regional level can contribute to green skills development: • Organising and stimulating the cooperation between a network of actors in green skills development (companies, government, companies and schools); • Setting a quantitative target for the creation of green jobs; and • Assisting and funding the establishment of training centres and schools.
Relevance for Flanders	In Flanders, there has been an increased focus on intermunicipal (and city-regional) cooperation, as a result of the wish to build on the internal state reform by giving local authorities more responsibility and by strengthening their administrative power and autonomy. On the other hand, there are local networks or partnerships that link the socio-economic partners and bind them with common objectives. Some of these are bottom-up initiatives, such as the networks in industrial areas (e.g. Antwerp harbour), some are initiated by government, such as the work of the Regional Socio-economic Consultation Committees (RESOC). Both have the potential to integrate issues related to (green) skills into their activities. Flanders does not have an equivalent to the Gothenburg Region which targets skills at the same level of intervention. Flanders has a much wider scope compared to the 13 municipalities under Gothenburg Region.
Recommendations for Flanders	Socio-economic partners should identify the type of networks or platforms appropriate for the promotion of green skills at the right level of intervention. Flanders could consider a collective target together with stakeholders regarding the creation of green jobs.

Denmark: Maritime innovations

In Northern Jutland (Denmark), a gradual process of greening the maritime industry provides us with some lessons regarding the role of various stakeholders. The case[96] is also included here as Northern Denmark houses a number of industries where green skills play an increasingly important role (such as transport, shipping and wind energy), industries which are also found in Flanders. Over the last two

[96] The case is taken from: Sotarauta, Markku, et al. (2021). The many roles of change agency in the game of green path development in the North. *European Urban and Regional Studies* 28,2,(92-110).

decades, the maritime sector in Northern Denmark has grown considerably by adding new value-added business integrating new activities around maritime equipment manufacturing and maritime services.[97]

The evolving demands of the maritime industry included new products and services related to environmental protection, and consequently skills development to work with these new technologies and equipment. These markets focus on the maintenance of fishing ships (or ships in general) in harbours or abroad, but also on retrofitting vessels with environmental technologies (Maritime Network Frederikshavn).[98] Regional cluster organisations such as the Frederikshavn Business Council and the Maritime Centre for Operations and Development (MARCOD), have played an central role in facilitating this change in the maritime sector in the region.

In their paper "The many roles of change agency in the game of green path development in the North", Sorarauta, Suvinen, Jolly and Hansen (2021) identify the different roles of the stakeholders in the change process described here. First, the role of a vision broker was played by the Port of Aalborg. The role of the vision broker is to transmit future-orientated ideas and boosting related thinking. They state that "Instead of having a shared vision introduced by visionaries, shared institutional entrepreneurship operates in the nexus of existing visions that push for continuity and new visions that cry out for institutional changes in support of green path development." Secondly, they identify mentors, organisations (or individuals) who counsel, coach and advise but who would not be actively engaged in a change process by themselves. In North Jutland, the regional cluster organisation MARCOD was seen as having this role. MARCOD helped large and small firms to develop regional networks with the aim of sharing knowledge and thus strengthen the regional cluster. It has organised seminars, advised firms to enter the maritime market and facilitated the development of new demonstration projects. Another actor, the Frederikshavn Business Council, was involved in supporting and coaching the local firms, performing a brokering function by involving different stakeholders in demonstration projects and negotiating the role of different partners in the projects. Thirdly, a variety of public agencies would provide support in terms of funding, building new infrastructure and navigating through regulations. In this case, the Port of Aalborg played an essential role in attracting maritime companies to the North Jutland region whereas the Danish Maritime and the Danish Shipowners Association not only addressed business activities but also represents the industry at a political level.

Title	Maritime innovations
Country	Denmark
Type of intervention	Networking
Institution	Various
Why is it a good practice?	Regional cluster organisations played a central role in facilitating growth in the maritime sector in Northern Jutland. They acted as knowledge platforms by sharing knowledge from different industries. Other roles in the change process are those of i) vision brokers (transmitting future-oriented ideas and boost related thinking); ii) mentors (who counsel, coach and advise but who are not actively engaged in a change process by themselves); and iii) support agents

[97] Green Growth in the Nordic.
[98] Mosgaard, Riisgaard, and Kerndrup (2014). Making carbon-fibre composite ferries a competitive alternative: The institutional challenges.

Title	Maritime innovations
	(who provide support in terms of funding, building new infrastructure and navigating through regulations).
Relevance for Flanders	Although this case may be considered an academic exercise, it has value in the real world in terms of identifying and assigning roles to different (existing) organisations when designing an industrial policy or innovation support instrument. As VLAIO plays a central role in many Flemish grant schemes supporting innovation, they could possibly play a role as facilitating agency.[99]
Recommendations for Flanders	When designing policies to support firms (especially SMEs) in change processes (in our case, promoting green skills), it is important to identify the different roles organisations can play in a particular (sub-)sector.

5.2 Role of different stakeholders

There are many types of stakeholder groups involved in consultative frameworks on skills development, including government agencies, training institutions, certification bodies, private-sector companies, international institutions, business, industry and professional associations, and trade unions. Which social partners are involved and what role they play within these mechanisms varies from country to country, and often depends on the sectors or topics to which the mechanisms are related, as well as the level on which the partnership operates (national, regional or local). One example of different roles within cluster of organisation was already given in the case above (Denmark: Maritime innovations). Most country-level policies on promoting green skills are carried out under institutional arrangements that already exist. For example, countries with existing systems of sector skills councils would incorporate green skill anticipation into current systems, but in some cases new organisations were set up (e.g., Onemev in France as discussed in chapter 4 on green skills forecasting and analysis).

A common feature of the institutional set-up around green skills is the weak connection between organisations involved in national policy-making on environmental topics and organisations involved in labour markets and skills policy, including skills anticipation.[100] 'Green skills' tend to be dealt with as part of existing decision-making structures and processes, rather than through permanent, dedicated organisations. As a result, it can be argued, they tend to 'fall between the cracks' of existing institutions. Although rare, there are examples of coordination, though tending to be for specific, time-limited purposes. As with institutional arrangements pertinent to 'green skills' regulations and policies, there is also variation in the set-up regarding the supply of green skills. The institutional set-up includes bodies involved in education and training and, specifically, the design and provision of qualifications and programmes. Local and regional levels can be an important component of the overall institutional set-up in a country. Developing new programmes for new occupations related to green employment or (more commonly) making adjustments to existing programmes/occupations takes place within existing institutional arrangements: there are no specific arrangements for green skills. Specific activities, such

[99] During the Peer Exchange Green Skills of February 2023, it was highlighted by a Flanders representative that they had initially brought sectors together, but they had difficulties thinking 10 years ahead. Then the spearhead clusters were included but they didn't have the network after the study to implement all the actions. That is when they recognised the specific roles for the different stakeholders: companies as frontrunners, knowledge institutions to think ahead and look at R&D and long run innovation and input from educators and trainers to see what this all means for skills. Social partners were also seen as important for training the members of their sectors although they are difficult to bring aboard since the projects sometimes overlapped several sectors.
[100] Cedefop (2019). Skills for green jobs 2018 update: European synthesis report.

as the production of skills anticipation intelligence through sector reports, ultimately feed into these existing arrangements.

The role of social partners in these arrangements varies according to the general situation for social partner engagement in the country concerned. Social partners tend to be less involved in higher education than in VET.

Germany: Education for Sustainable Development

In Germany, developing training programmes for the supply of green skills is based on social dialogue and consensus. Industry associations and trade unions are involved frequently in the Advisory Boards that supervise the design of training programmes. Within the framework of the UNESCO World Action programme Education for sustainable development, a national platform "Education for Sustainable Development" (ESD, *Bildung für nachhaltige Entwicklung*) was established.[101] It assembled decision makers from politics, business and civil society, recently adopting a national action plan. This case links to the case described in Section 2.1 on Germany's Federal approach to a national strategy (on skills). However, the present case can be used to show how (and by whom) the strategy is developed into an action plan:

1. An expert forum[102] was to review the status (of TVET) at all levels order to identify possible entry points for ESD.
2. The expert forum was to identify additional potential for ESD in TVET by integrating formal vocational education and training with informal/experience-based education/occupational experience. This action is supported by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) with targeted networking of stakeholders in the ESF-funded TVET for SD programme.
3. Workplaces and vocational schools are to be established as sustainable learning spaces which requires the development of indicators that can serve as a roadmap. Networking among such sustainable learning spaces needed to be improved with regard to connections and interfaces. The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supported this measure by funding model projects on non-school, practice-based occupational information provision under the ESF TVET for SD programme. The German Confederation of Skilled Crafts (ZDH) and the Federal Ministry of Education and Research (BMBF) also supported this measure by promoting the establishment of sustainable development in the workplace on the basis of the whole institution approach. Furthermore, the Central Agency for Continuing Vocational Education and Training in the Skilled Crafts (ZWH) developed and established corresponding training provision for individuals in leadership positions, primarily in small and medium-sized enterprises and the Federal Ministry of Education and Research (BMBF) supported the BIBB funding focus on Vocational Education and Training for Sustainable Development with a funding line dedicated to the creation of sustainable in-company learning spaces.

[101] UNESCO Global Action Programme on Education for Sustainable Development (2015-2019).
[102] The expert forum includes expert from organisations such as: Federal Ministry of Education and Research, German Confederation of Skilled Crafts, Confederation of German Employers' Associations (BDA), Engagement Global gGmbH, German Federal Environmental Foundation, University of Lüneburg, German Trade Union Confederation (DGB), Federal Institute for Vocational Education and Training (BIBB), Association of German Chambers of Commerce and Industry (DIHK), Trade Union for Education and Science, Bundesverband der Lehrerinnen und Lehrer an beruflichen Schulen e. V. (Federal Association of Teachers in Vocational Schools e. V.), Bundeselternrat (Federal Council of Parents), Federal Ministry for Economic Affairs and Energy, Federal Ministry of the Environment, Nature Conservation, Building and Nuclear Safety, and the Federal Ministry of Education and Research.

4. It was recognised that sustainable employability includes aspects that apply in social and private life as well as in the work setting. It was therefore considered necessary to define skills needed to implement sustainability in the training and work process. BMBF was therefore to commission BIBB with a study to identify overlaps in relation to sustainability between the TVET for SD-specific skills profiles. BMBF would also promote skills building for trainers and trainees and support BIBB in funding a funding line for the TVET that target skills building for trainers and trainees in additional selected occupations.
5. On the basis of the status review, sustainability-oriented skills were to be integrated into curricula and suitable educational resources were to be developed. Through Engagement Global and in cooperation with the Länder, BMZ supports the Länder initiatives "Education for Sustainable Development".

Title	Education for Sustainable Development
Country	Germany
Type of intervention	National plan
Institution	Platform Education for Sustainable Development" (ESD), consisting of *Bildung für nachhaltige Entwicklung*) was established.[103] It assembled decision makers from politics, business, education and civil society.
Why is it a good practice?	In Germany, developing training programmes for the supply of green skills is based on social dialogue and consensus. The "National Action Plan on Education for Sustainable Development" offers favourable guidelines for a growing public awareness and an increasing supply of relevant educational opportunities.
Relevance for Flanders	The Action Plan provides an example of linking higher level goals to concrete action of various stakeholders. Furthermore, the Action Plan provides suggestions for appropriate action to bring about a reliable structural implementation of ESD at the local level.
Recommendations for Flanders	The Action plan recommends the establishment of collaborative structures between several institutional actors that form ESD landscapes, such as municipal administrations, educational institutions and schools, vocational training or universities, and the field of nonformal and informal education, offered for instance by civil society organizations.

France: High level coordination

When discussing the issue of skills anticipation in France, Cedefop argues that the country has historically invested heavily in this aspect, with strong stakeholder and social partner engagement, but the activities are often fragmented, with several initiatives (covering assessment, forecasting and foresight) undertaken by different actors (public authorities, chambers of commerce, social partners, and sector organisations) in parallel.[104] The complexity of skills anticipation and high number of agencies engaged may actually have prevented users to find the skills intelligence they require.

The coordination of green skills issues in France was first organised through the *Grenelle de l'environnement* – environment round table - launched in 2007, and then the Paris 2015 climate change conference (21st United Nations Conference of the Parties, referred to as COP 21). The round table

[103] UNESCO Global Action Programme on Education for Sustainable Development (2015-2019).
[104] Cedefop (2022). Skills anticipation in France (2022 Update).

involved a multi-level governance process with five partners – the government, local authorities, trade unions, business and voluntary sectors – in a process called 'governance of the five'. It largely provided the basis for the second national strategy for sustainable development covering 2009-12, as well as the follow-up plan, launched in 2010, to mobilise territories and sectors (*Plan de mobilisation des territoires et des filières*); this was established with the aim of enriching green growth by supporting the development of new activities and adapting skills. As of 2012, the new government anchored its strategy in the preparation of the COP21. This new strategy introduced the principle of a national climate conference to be held annually, to reignite the multi-level governance process introduced by the *Grenelle de l'environnement* and to revive the enthusiasm of the round table, which had begun to run out of steam.

Title	High level coordination
Country	France
Type of intervention	Coordination
Institution	Various
Why is it a good practice?	In France a national climate conference is held annually since 2012 as a follow up to the round table discussions taking place 15 years ago, where green skills was one of the topics Linked to this initiative are a number of inter-ministerial professional advisory committees, managed by the Ministry of Education, set up to discuss – among others – the issue of green skills.in the context of designing new education programmes and adapting existing ones to labour market needs.
Relevance for Flanders	There are many agencies in Flanders that hold regular (yearly) conferences such as that of the Flemish Teachers Association Velov (Vereniging Lerarenopleiders Vlaanderen)[105] and EPALE (Electronic platform for Adult Education in Europa)[106] to name only two. Any of these could be used to host a conference around the theme of green skills.
Recommendations for Flanders	Set up a conference or round table event on a regular basis (once every on or two years) to monitor the progress towards stated objectives regarding green-skills anticipation and policy implementation.

Ireland: Green Building Council

The Irish Green Building Council (IGBC) was set up in 2011 with organisations and businesses from across the value chain of the built environment, including architects, engineers, contractors, universities, professional institutes, NGOs, local authorities, energy companies, leading national and transnational companies. There are presently some 300 members. The Council's aim is to provide a source of leadership for sustainability and quality in the built environment, to promote and assist in the provision of credible metrics for measuring progress towards the end goal of sustainability, and to be a source for companies transitioning their activities towards more sustainable practices. The IGBC has developed a roadmap to decarbonise Ireland's built environment which outlines a set of actions to halve the sector's emissions by 2030 and reach carbon neutrality by 2050. Furthermore, IGBC hosts green building events and develops education modules. It runs a free course on sustainability in the built environment and offers training on topics such as Green Building Certification, and Whole Life Carbon analysis. Due to

[105] Velov. Website: Velov-conferentie: Meester in didactiek.
[106] European Commission. Website: EPALE community conferentie 2022 in Vlaanderen - alsof je erbij was.

the small size of the country, networking in Ireland is often seen as easier compared to some other countries ("people know each other").[107]

Title	Irish Green Building Council
Country	Ireland
Type of intervention	Setting up a building council
Institution	Building Council
Why is it a good practice?	The Irish Green Building Council was set up with organisations and businesses across the value chain of the built environment, and with NGOs and local authorities. The Council's aim is to provide a source of leadership for sustainability and quality in the built environment, to promote and assist in the provision of credible metrics for measuring progress towards the end goal of sustainability, and to be a source for companies transitioning their activities towards more sustainable practices.
Relevance for Flanders	The Belgian Construction Association (Embuild), is well placed to take on the theme of green skills as a priority (possible in cooperation with an organisation such as VLAIO).
Recommendations for Flanders	Encourage sector organisations such as Embuild to take up the topic of green-skills and position it as a top-priority.

[107] Gloria Callinan, online peer exchange on green skills (February 2023).

6 Private sector initiatives

Green skills are emerging across industries and services, not only in core sustainability areas like ecosystem management, environmental policy, and pollution prevention, but also in areas not traditionally considered green. In fact, globally, sectors experiencing the most significant increase in demand for green skills are manufacturing, energy and mining, and construction.[108] This puts pressure on governments, corporations and individuals to act decisively in order to build the supply of workers with green skills.

In this chapter, we discuss how companies throughout the EU are taking up the challenge of improving the green skills of their employees, either through training organised internally, or by engaging external training institutes or individuals. Especially in sectors driven by large companies (such as automotive or chemical industry, well-integrated in global or regional value chains) the private sector acts as a catalyst and driver of skills development programmes often provided in-house[109], whereas SMEs have to rely on (often limited) publicly funded skills programmes, since they have more difficulty in finding the time and resources to provide training for their staff. First, we provide an example of a large company organising and implementing its own skills policy. This is followed by examples of the strategies and actions on (green) skills taken up by and offered to SMEs.

A recent survey of 51 national and regional chambers from 15 European countries concluded that in general, the private sector is positive about the green transition and the impact that it has at both national and regional levels[110]. One company that is at the forefront of a green transition is the Volvo Group which was visited for the purpose of this project by a delegation of Flemish civil servants.

6.1 Large companies and green skills

Volvo Group[111], based in **Sweden** (Gothenburg), is an example of how a firm deals with the issue of reskilling and upskilling of its staff on green issues internally, by creating its own training institute, the Volvo Group University (VGU). VGU is fully owned by Volvo Group and is used as a global training centre aiming to develop competences through quality assured training. Globally, some 15,000 persons (30% female) participate annually in training via some 80 training courses, mainly taken during working time. European Social Funds (ESF+) supports some of them (3,500 to date of which 43% female) to train staff in new technologies, focussing on green skills and other sustainability aspects. For instance, they train the trainers on the battery and fuel cell business. Volvo Group also participates in a technical school, the Göteborg Tekniska College, which is jointly owned by Volvo Cars and the City of Gothenburg.

Volvo University's learning approach is based on the corporate strategy to become 100% fossil fuel free by 2050. It has defined four aspects of learning: i) increased awareness; ii) new skills (up- and re-skilling); iii) in-depth knowledge; and iv) behavioural change. The VGU learning strategy is focused on general competence development, of which green skills are a part which – according to a Volvo

[108] LinkedIn (2022). Global Green Skills Report.
[109] UNIDO (2020).
[110] Euro Chambers (2022). Green skills in the eyes of European businesses Flash Survey – May 2022.
[111] With 95,000 employees, Volvo Group is the largest employer in the Gothenburg region. Volvo Group produces trucks, buses, construction equipment, boat engines, including with electrified solutions. Volvo group is different from Volvo cars, which is owned by Ford.

University spokesperson – is evidence of having green skills more mainstreamed into the general Strategy rather than presented it as something different or additional. For Volvo Trucks, the first major pilot in this department is the competence shift of its plant in Blainville (France), where the production of diesel driven trucks will be replaced by production of fully electric trucks, using the same people to manufacture the trucks.

One of the challenges facing the VGU is how to reach out to employees with relevant training with over 85,000 employees globally. One approach has been the "Click 'n Learn" Programme, which targets industrial workers to support them to find the relevant courses, including workers that do not have access to a computer at home. Another major challenge is to know when research and development move into production, and up-skilling at a large scale will be required. To align these processes, the VGU keeps abreast of Research and Development (R&D) activities throughout the company. A further example of the potential for reskilling is the approach Volvo Truck takes when recruiting new staff: as they have difficulty in filling vacancies with people that have the right technical education and skills, they focus on some basic skills already present with potential candidates and offer them a training course at the start of their contract. One of the examples that was mentioned during the visit to Volvo was the recruitment of hairdressers who are used to being very precise in their work and are used to doing their work standing up.

Throughout Europe there are examples of companies in the steel industry who have linked up with educational institutes, not only for the purpose of creating a pool of suitable candidates to fill future vacancies, but also to upgrade the skills of their employees, mostly related to need to improve on green skills. For instance, the **Polish** steel producer PGO collaborates with the Silesian University of Technology (Gliwice) in the framework of a programme dedicated to current steelworkers as well as job seekers who wish to develop their technical knowledge in metallurgy. During this one-year course, participants are trained through a combination of theory and practice on sustainability issues related the production and work methods for steel products, such as reducing waste and improving energy and resource efficiency. The same University also partners with CMC Poland Sp. z.o.o., a US based, Fortune 500 steel company. In this partnership, there a growing attention to the application of green skills and capabilities in production processes.

The **Italian** steel company AST Terni recently concluded a partnership with the University of Perugia to jointly organise a three-month programme in Metallurgical and Steel Technologies where students are taught about the processes to produce a variety of stainless-steel products, and learn about the newest technologies to make the production processes more sustainable.[112]

An example from **Spain** is the environmental training programme operated by Acciona called Acciona University. In 2015, the programme provided 34,618 training hours to employees in green and environmental subjects arranged not only in short courses and one-day activities but also courses of longer duration, organised in cooperation with the University of Alcalá (Madrid).

[112] Acciai Speciali Terni (2018). AST-UNIPG, Una nuova convenzione per creare lavoro e formazione professionale.

Title	Green skills and multinationals
Country	Global
Type of intervention	Private sector initiatives
Institution	N/A
Why is it a good practice?	Volvo Group is an example of a firm that deals with the issue of reskilling and upskilling of its staff on green issues internally. It created its own training institute, and based its learning approach on the corporate strategy to become 100% fossil fuel free by 2050. Volvo Group also participates in (and partly owns) a technical school. Throughout Europe there are examples of companies which link up with educational institutes, to upgrade the green skills of their employees.
Relevance for Flanders	Like Sweden, Flanders also hosts several big companies (such as Volvo in Ghent), and these companies can play a major role in the green transition by creating green jobs and training their employees in green skills.
Recommendations	Flanders should assess the (potential) contributions of (large) companies to the green transition to see what they can do and what they would need from the Government to implement this. An organisation such as the Flanders Innovation & Entrepreneurship (VLAIO) can play an important role in this process.

6.2 SMEs and green skills

Whereas many of the larger firms are able to invest in their own training facilities and will finance courses in collaboration with education institutes using, SMEs do not have the resources and know-how to address this issue and are often scarcely aware of the positive effect of greening the skills of their workers on their business. This lack of awareness means that appropriate skills are not systematically developed. It is quite a common attitude to believe that required skills (regardless of their transferability) can be developed within business processes and that practical experience is sufficient.[113] This is where the collaboration between companies, often through industry associations or other collaborative arrangements, can facilitate training programmes which are especially helpful for SMEs. However, it should be noted that such organisations often do not include typical “frontrunners” that are starting in a transition.

In **Romania**, the Timis Chamber of Commerce, Industry and Agriculture coordinates the “Circular Economy in the Balkan Countries” project. The project aims to create and empower a network of actors from the Balkan region and other countries for the development and implementation of circular innovation in business and policy, fostering shared learning between "Beacons" (Centres) to increase the capacity of industry and society at large for circular systems change and climate action. In 2020, it provided training for companies, in 2021 training for municipalities regarding the circular economy, and in 2022, it developed a service that can be offered to companies to help them understand, assess, and implement the principles of sustainability and circularity. The Chamber also organises a large green business idea competition called the ‘Climate Launchpad’.

[113] Balcar at al. (2011). Transferability of Skills across Economic Sectors.

Industry organisations and individual companies, often enter into partnership arrangements to develop green skills. Companies participating in such partnerships can act as frontrunners in green production processes and set ambitious standards in green skills for their employees, which can act as an inspiration for other companies. Examples of this are found in **Germany**, where the chemical industry established a sustainability initiative, Chemie3, a joint institute at sector level with the sectoral industry association VCI (*Verband der Chemischen Industrie e.V.*), the trade union IG BCE (*Industriegewerkschaft Bergbau, Chemie, Energie*) and the respective employer association BAVC (*Bundesarbeitgeberverband Chemie*).[114] Its goal is to anchor sustainability as the guiding principle in the chemical industry. The initiative reflects the fact that in German industry there is typically a close relationship between green skills, workplace safety and improving resource efficiency. Chemie3 offers webinars, step-by-step guides, stakeholder events and free-of-charge sustainability checks to assist businesses with implementing sustainable practices industry-wide. Webinars provide both business executives and employees with up-to-date sustainability-related information, experience reports, and best practice cases which show companies how to make their practices and workplaces more sustainable. Chemie3's sustainability check is available to small and medium-sized members and assesses sustainability practices in a chemicals company through criteria based on the initiative's guiding principles.

Although it is hard to quantify the results of Chemie3's skills delivery programmes there is some data on Chemie3's reach within the industry. By 2016, 84% or 266 chemicals businesses in the country knew about Chemie3. Webinars that included skills programmes on energy efficiency and industrial symbiosis have received considerable interest. Chemie3's key strength is that its activities cover all angles of sustainability in the chemicals industry. Having been initiated and being managed jointly by the industry's trade association, the main trade union, and the national employer's association, it boasts the expertise to address sustainability ecologically but also socially and economically. This is unique among sustainability initiatives because those led by Non-Governmental Organisations (NGOs) often focus on ecological aspects only, while those of trade associations tend to be limited to economic considerations. However, Chemie3 lacks practical on-site training in its repertoire of skills delivery programmes. The webinars, step-by-step guides, stakeholder events, and sustainability checks all explain how to implement sustainability practices theoretically. But this typically occurs out-of-company and participants need to introduce said practices to their businesses themselves.

Furthermore, in **Germany**, there are some 36 inter-company vocational competence centres located around the country, some of which focus on sustainability issues and green skills.[115] These centres also pay attention to the development of soft skills and processes relevant for green technologies, important, as the green transition involves both technical, occupationally specific skills and generic, soft skills.[116] These institutions play an important role in promoting green skills (and related technologies), especially in the absence of other support measures that might offer green skills training to SMEs. New advanced content for green skills programmes is often developed in such centres and brought to a large number of firms, especially SMEs.

[114] Chemie3. Website: Chemie3.
[115] These include for example, the Competence Centre for Future Oriented Building (Kompetenzzentrum für zukunftsorientiertes Bauen) in Hamburg, the Competence Centre for Sustainable Crafts (Kompetenzzentrum Nachhaltiges Handwerk) in Thuringia and the Competence Centre for Sustainable Building (Kompetenzzentrum für Nachhaltiges Bauen) in Potsdam For more details visit: https://www.bibb.de/dokumente/pdf/a43_2021-03 uebersicht_BMBF_BIBB_gefoerderte_Kompetenzzentren.pdf
[116] ILO (2019). Skills for a greener future: A global view.

At **European level**, the "Next Tourism Generation Alliance" (NTG) is an example of a partnership set up to develop a collaborative and productive relationship between education and industry.[117] The NTG Alliance[118] provided employees, employers, entrepreneurs, teachers, trainers and students with a set of Core NTG modules in digital, green and social skills. The NTG approach, modules and learning methods were integrated into the current European Vocational Education and Training (VET) system and Industry, providing a benchmark, tools and good practice for green and social skills to support sustainable development and digital and technological innovation within sub-sectors operations.

In **Sweden**, there is a somewhat bigger involvement of the education sector. To stimulate the workforce involved in renovating and retrofitting buildings, the Swedish Energy Agency (SEA) has built a number of networks where members test and evaluate new technologies in new construction and renovation projects thereby forming a trustworthy link between new technology and methods and a common application in society. Through the networks, members participate in development projects which are in line with their areas of interest, which leads to new skills in the company, and they have an opportunity to show clients their engagement in energy efficiency and climate related questions. However, there is a general consensus that skills in the construction sector – whether green or non-green - are lacking. In order to green the sector, building owners and companies need to acquire knowledge of the (new) type of materials to use and the new working methods those may require. As the same time, there is a need create awareness among private citizens to address the issue of energy (consumption) in the build environment.[119] Given the importance of energy saving in the Flemish housing sector, and in absence of a similar scheme as the one just described, the Swedish example may offer an interesting approach to promote green skills in the building sector.

The Swedish Energy Agency (SEA) has also developed the programme 'Energy Lift Programme', which shows how to integrate energy efficiency skills into CVET programmes by adopting a flexible and innovative approach in offering training modules compatible with workers' needs (e.g., on-line solutions, staggered timetables). The education provides a holistic view of the construction process linked to low energy building in terms of new production and renovation. With a budget of EUR 450.000 per year and the collaboration with well-organised regional energy agencies in the country, the project[120] was successful in drawing in people through all stages of the construction process and from small (and large) companies and working methods are spreading. The number of participants in the Energy Charter against near zero energy houses was 1,643 who registered on the web courses, 749 people who attended a seminar and 352 people who completed their course certificate. Finally, as part of the Swedish BUILD UP Skills project SWEBUILD, the Swedish Construction Federation launched Energy Builders (*Energibyggare*)[121] to raise the awareness of the important role of energy in buildings, which is not always well understood.[122] The programme has developed a four-hour interactive web-based training in the field of energy-efficient construction and renewable energy tailored to all parties active on a construction site, including builders, installers, supervisors and managers. The programme includes

[117] Next Tourism Generation Alliance. Website: Next Generation Tourism.
[118] NTG was a European project for a duration of 4 years (1st Jan 2018- Dec 2021). The project was coordinated by Federturismo Confindustria, the Italian Tourism Trade Association. The total grant was 4 million euro.
[119] Online peer exchange on green skills (February 2023), presentation by Par Lundstrom, Swedish Installation Federation.
[120] Co-financed by Interreg Europe under the programme BUILD2LC. For project details see: https://www.interregeurope.eu/good-practices/education-close-to-zero-energy-constructions-energy-lift-energilyftet
[121] Energibyggar. Website: https://buc.se/utbildningar/energibyggare/
[122] Online peer exchange on green skills (February 2023), presentation by Par Lundstrom, Swedish Installation Federation.

areas such as thermal insulation, airtightness, moisture control and installations. Upon successful completion of the training, the acquired qualification can be registered in the special Skill Database.

In **Sweden**, the Federation of Installation firms (I*nstallatörsföretagen*) has some 3,600 members of which 92% have less than 25 employees who work on heating, ventilation, water, electricity, grid, security and telecommunications. Installatörsföretagen acts as a corporate headquarter, providing assistance, especially in the field of HR and skills. They have their own training centre and they own two upper secondary schools. Some 90% of the pupils find employment when they leave school. It is noted that climate adaptation has become the main business policy for the Confederation of Swedish Enterprises as a whole, and for member organisations like Installatörsföretagen. It follows up on climate adaptation plans with reports and meetings/conferences and although Government funding on climate adaptation is lavish it is difficult to get a complete overview on funding. Installatörsföretagen started cooperation with Gothenburg Region Education in 2017 to work on setting certification standards. It was a new experience but there was an excellent dialogue.[123]

In **France**, the private sector is involved in training through several means: by companies directly financing training actions for their employees; by companies paying a 'training' contribution corresponding to a proportion of the payroll which is managed by State-approved organisations or *Organismes paritaires collecteurs agréés* (OPCAs); and by obliging companies with more than 300 employees to anticipate to internal jobs and skills.[124] This system also introduced for the first time the concept of certification or a quality label for the VET providers. As these quality assurance measures did not lead to a full harmonisation of practices, especially as they did not make them clear for private companies and the general public, a new national quality reference framework for the VET providers was set up in 2018. This new framework also extended the quality requirement to apprenticeships, and made the new certification, called Qualiopi, mandatory for the VET programmes supported by public funding.

In **Ireland** a national agency for workforce learning, with a mandate to advance competitiveness, productivity and innovation of Ireland's businesses through enterprise led workforce development was set up by the private sector. Skillnet Ireland is a collection of private sector businesses that collaborate through an array of networks, to address the skills needs either within a sector or a region. *Green Tech Skillnet* has its focus on the renewable energy and green technology sectors. Membership of the network is open to private enterprises in the renewable energy and green technology sector based in the Republic of Ireland. Current programmes available include "Work in Wind", "Wind Turbine Technician" and "nZEB Building Programme". The Network delivers training and networking events to a growing workforce. In 2020, Green Tech Skillnet provided 1,989 person days of training, over a total of 830 participants. 'Climate Ready Academy' is an initiative of Skillnet Ireland, and is a collaboration between Chambers Ireland, Wind Energy Ireland and Sustainable Finance Ireland. It equips businesses with the skills they need to respond to climate change and thrive in a low-carbon economy. It aims to support Irish businesses in developing the skills and talent required to mitigate the effects of our changing climate and environment, and current programmes available include "Sustainability Pass", "Energy Leaders Programme" and "Masterclasses". Skillnet is co-funded by the National Training Fund and by employers directly and has proved to be a flexible and effective model for companies of various

[123] Based on a stakeholder interview.
[124] Cedefop (2018). Skills for green jobs: an update; France.

sizes to meet their short- and medium-term skill needs. Over 60 individual networks are currently operational across a wide range of business sectors.

Title	Green skills and SMEs
Country	Sweden, France, Ireland, and Sweden
Type of intervention	Private sector initiatives
Institution	Various companies
Why is it a good practice?	SMEs often have to rely on some form of collaborative arrangements to facilitate training programmes. Usually, industry organisations and individual companies enter into partnership arrangements to develop green skills and the companies participating in such partnerships act as frontrunners in green production processes, which subsequently act as an inspiration for other companies. Another approach is found in France, where companies can either directly financing training for their employees or they pay a 'training' contribution corresponding to a proportion of the payroll which is managed by State approved organisations (OPCAs). In Ireland, businesses (large and small) collaborate through an array of networks, to address their (green) skills needs. The Green Tech Skillnet, with a focus on the renewable energy and green technology sectors is co-funded by the National Training Fund and employers. In Sweden, the Federation of Installation Firms acts as a corporate headquarter for SMEs, providing assistance, especially in the field of HR and (green) skills.
Relevance for Flanders	In Flanders, SMEs can benefit from support programmes to improve the (green) skills of their employees, including the Flemish Innovation & Entrepreneurship Agency (VLAIO). However, many projects are geared more toward companies involved in innovative technologies and not toward small companies in the more traditional sectors. Also, most companies (SMEs) in a sector such as construction, lack time to train workers.
Recommendations for Flanders	Next to supporting (small) firms involved in innovative technologies, programmes can be designed specifically to support the efforts of the companies in the more transitional industries to upgrade the green skills of their staff. Getting workers from SMEs involved in (lifelong) learning requires trust building with paying for time.[125] Branch organisations should be encouraged to include new innovative firms (start-ups) involved in different transition processes in their organisations.

[125] Pär Lundstrom, Swedish Installation Federation.

7 Summary of lessons and final recommendations

This report is based on a literature review of best practices related to green skills in the past decade, study visits to two countries (Sweden and France), with a delegation from the Flemish Department of Work and Social Economy and the Extended Project Board (EPB), and an online peer exchange with experts from Sweden, France, Ireland and the Netherlands. The aim of the study was to assess best practices relevant to the green skills transition in Flanders. The report is structured around five themes, for each of which a number of recommendations have been formulated. This chapter provides a summary of the main lessons and recommendations.

7.1 Strategies, policies roadmaps and funding programmes

Summary of lessons from best practices

Lessons from countries such as France and Germany show that where green skills and jobs are included as an integral part of national long-term strategies on sustainable development, they are regarded as a crucial lever for realising the green transition. Policies, regulations, programmes and roadmaps can also be developed at regional or local level which are more focused on short-term actions. Although there are some initiatives in Flanders to promote green skills development or related skills, green skills are usually not explicitly mentioned. From an international perspective, countries such as Spain, France, Germany and the Netherlands have succeeded in creating policies focussing on a sector or a particular target group that accentuate green skills. A takeaway from the Peer Exchange on Green Skills is that the circular framework applies to all sectors and the green transition should therefor be powered from a circular perspective. Furthermore, when designing strategies, a thorough knowledge of the requirements for successful implementation is crucial and can be improved by cooperating closely with (private) partners in the field or sector. Finally, European initiatives can provide an excellent stepping stone for acquiring knowledge on green skills and roadmaps which countries can use for developing national strategies and roadmaps.

Key recommendations for Flanders on strategies, policies and roadmaps for green skills

- Green skills and jobs should get a more prominent place in all sustainability related policies and strategies. The policies should include a section where the impact on green skills and jobs is estimated and the needs or deficiencies are taken into account. Concretely, Integrate *skills needed for the green transition* as a transition priority in the updated 2050 Strategy to emphasise the political urgency and to guide all future policy initiatives of the Flemish government;
- Initiate a policy to improve cooperation between the private sector and schools (e.g. by shortening the lines of communication) in order to facilitate practices such as dual learning, and the development of trainings and curricula (especially in the field of innovation) and certifications related to green skills and broader skills development;
- Take on board the many practical lessons from the cases of the EU's Build Up Skills (BUS) programme, including the one carried out in Belgium. For example, we learned from the Irish BUS that it is difficult to attract younger people and especially girls to the construction sector. One way to target women is by setting up targeted information campaigns and engaging with young girls in schools. More generally, many BUS projects focused on setting up large-scale and

flexible qualification and certification methodologies to facilitate the development and showcasing of competences.[126] Also in Flanders, a faster and easier system for qualifications and certifications should be developed for skills that are essential to the green transition and thus need to be developed on a large scale and at a fast pace.

- Consider the development of a roadmap at local level (one or more municipalities) with the involvement of only one or two sectors or themes. After a successful implementation, the scope of the roadmap can be broadened to include all sectors and the whole territory of Flanders;
- In the context of an initial focus on a sector or municipality it is recommended to initiate an action-based programme or initiative targeted at specific groups.[127] These actions could entail training programmes for upskilling and reskilling, establishment of green start-ups, creation of green jobs in established companies, etc. These initiatives could be given a narrower scope by focusing on target groups such as women or unemployed since this is a largely untapped group of the labour force for certain sectors in Flanders;
- Do not focus only on specific target groups but broaden it, considering specific sectors (like the construction sector) and topics (like batteries or heat pumps).
- Expand the scope of the Flemish programme 'Energy Scan' to increase its popularity beyond low-income households, could provide additional demand for green (energy-efficient) products and services. Furthermore, make training an integral part of the program and target the unemployed to become "energy advisors", addresses both green skills shortages and unemployment. This could also apply to energy advisors in branches such as banking, local authorities real estate companies, etc.

7.2 Vocational Education and Training

Summary of lessons from best practices

There are several ongoing initiatives at vocational schools, which are designed to give green skills a more prominent place in the labour market, and making green topics an integral part of the teaching materials, will stimulate the transition towards a workforce with green competences and skills. Furthermore, by guiding the apprenticeships in vocational schools to green occupations and by increasing partnerships with businesses the integration of young people in the green economy will be encouraged. This collaboration between the private sector and the education system is especially effective when it allows for curricula to be updated on a more regular basis and provides a more flexible offer of trainings in green occupations. It is important for the education system to train young people, but the offer of training for the current working population should also be aligned more with the needs of businesses and the challenges they are facing either in developing their future path or in their day-to-day activities such as accessing green subsidy schemes. Finally, giving regional school boards (more) statutory powers for managing education and training makes it possible to set up effective (local) networks with social partners.

[126] European Commission. Website: BUILD UP Skills.
[127] During the Peer Exchange Green Skills (February 2023), it was highlighted that the problem is often not in the resources or money but the direction they flow to. It was argued that – in the Netherlands – funds are currently used in ways that do not contribute to the circular transition in an optimal way.

Key recommendations for Flanders on Vocational Education and Training for green skills

- Give green topics (as part of the SDGs) a more prominent place to teach VET pupils and students how these concepts translate into other topics, particularly topics also promoted through the STEM agenda;
- Stimulate schools and training centres to adjust their curricula based on the short-term needs of the employment market for green skills;
- Ensure that the actions that follow from the two above recommendations also find their way into agreements between the private sector and the VET schools. These agreements should specifically refer to green transition and make clear how a company's policies in this domain translates into the school's curriculum.
- Let regional centres (either RTCs or other regional bodies) play a more important role in linking VET schools to needs of the private sector, by stimulating their coordination through regional initiatives;
- Devolve (some) powers to local bodies which can liaise more effectively with local stakeholders;
- Provide room for companies and sectors to formulate (and fund) their demands in terms of updating VET courses and curricula to include (new) green skills for their employees;
- Regularly review diplomas and certifications to ensure the availability of training for green skills; and
- Stimulate apprenticeships with companies that have green occupations to improve the image of those jobs.

7.3 Public Employment Services

Summary of lessons from best practices

Flanders possesses a very strong developed competence framework and skills intelligence programmes. For instance, the Competent database is managed and utilised by the VDAB (the Flemish PES) and contains the required competences for jobs in Flanders. The analysis and forecasting of skills, qualifications and occupations are already used by VDAB and other actors such as AHOVOKS, thus making the lessons learned from other countries on these topics less relevant.

Furthermore, combining training and employment incentive measures provide a sense of security and perspective for both employers and employees and increase the success rate of programmes for the unemployed and youth. For instance, subsidies can be used to stimulate companies to give a permanent position to trainees when their traineeships end. Overall, there is a significant need for increasing the focus of PES activities on green jobs to stimulate the green transition.

Key recommendations for Flanders on Public Employment Services related to green skills

- VDAB is already a good practice in the European field of PES and is thus in a good position to strengthen its focus on the green transition across all its activities;
- The forecasting methods and the available in Flanders are great assets that should be kept at their high level of quality. Forecasting takes place on several levels: macro (Flanders), meso (sectors, cluster and innovation actors) and micro (companies). The macro level is mainly consisting of integrated labour market projection models and ad-hoc studies such as the skills forecasting for energy-intensive sectors. For the meso level, the SCOPE studies executed for

clusters through a Europe WSE call (previously ESF) are the main tools. Finally, on a micro level, these SCOPE results are then translated into companies though projects;

- Specifically on the Flemish competent database, a special segment could be added labelling green skills separately;
- Improve matching by using technology (semantic search 'green' etc.) and improving the skills taxonomy;
- Keep the analysis of skills, qualifications and occupations embedded in the activities of established organisations (VDAB) to avoid having to work with a tender-based study system;
- The VDAB possesses regional and local offices and training centres which ensure their activities can be tailored to the local context and demography. These are crucial for connecting with the local population and should be maintained; In addition, VADB should continue its current work with master campuses and cooperation with other training actors;
- Conduct research or contribute to identifying 'green skills' and 'green occupations', for example by introducing relevant questions into vacancy and skills surveys sent to employers;
- Greening jobs can make "unpopular jobs" more attractive. So, PES could stimulate rephrasing vacancies and adapting job contents to make them more green (e.g. "climate jobs"), and clustering or labelling vacancies in the area of the green economy to make the need for green jobs and skills more visible, e.g. by setting up monitor of green skills to collect information on number and kind of jobs, which branches, etc.;
- VDAB should be involved in sector skills alliances related to the greening of the economy and labour markets;
- Partner with local level actors (employers, chambers, associations, civil society etc) to identify local challenges and employment potentials and to increase the transparency of green and greening jobs offers; and
- Financially support short- and long-term training measures to acquire the required generic and transversal skills, as far as this complies with PES responsibilities.

7.4 Governance and stakeholders

Summary of lessons from best practices

In Flanders there is already an increased focus on intermunicipal cooperation, and there are local networks or partnerships that link the socio-economic partners which have common objectives in terms of green employment and skills' targets. However, international best practices show that such initiatives can be strengthened and roles of different stakeholders more clearly defined. Furthermore, knowledge platforms which share knowledge from different industries and increase cross-sectoral cooperation can stimulate awareness raising on green skills and filling in vacancies for green occupations.

Key recommendations for Flanders on governance and stakeholders related to green skills

- Identify the type of networks or platforms appropriate for the promotion of green skills, perhaps linked to the SCOPE projects and their steering groups;
- Flanders could consider a collective target together with stakeholders regarding the creation of green jobs;
- Roles should be identified amongst stakeholders active in change processes in Flanders; and
- Identify which organisation could be used to organise a yearly conference focussed on the theme of green skills and given a mandate to monitor progress in this domain.

7.5 Private sector initiatives

Summary of lessons from best practices

Large corporations often organise internal training schemes or collaborate with educational institutes in the vicinity, sometimes supported by grant schemes funded through local, national or EU programmes. In contrast, SMEs often have to rely on some form of collaborative arrangement to facilitate training programmes for their staff. Usually, industry organisations and individual companies enter into partnership arrangements to develop green skills and the companies participating in such partnerships act as frontrunners in green production processes, which subsequently act as an inspiration for other companies. Flanders hosts several large companies which can play a major role in the green transition by creating green jobs and training their employees in green skills. Furthermore, in Flanders, SMEs can benefit from support programmes to improve the (green) skills of their employees, including the Flanders Innovation & Entrepreneurship (VLAIO), but many projects are geared more toward companies involved in innovative technologies and not toward small companies in the more traditional sectors. In the context of this project, we also explored ways in which SMEs could benefit from actions by large(r) firms.

Key recommendations for Flanders on private sector initiatives for green skills

- The Flemish government should asses what role they can play in stimulating the cooperation between large corporations with internal training capacity and SMEs in the context of the green transition. This could take the form of a public-private partnership programme.
- Identify opportunities for firms to improve the green skills of their employees, such as the schemes offered by VLAIO, but also EU schemes and increase their visibility;
- Design programmes to address the challenges of industry branches using more traditional technologies, such as the textile and furniture industry. Circular and digital strategies can support the transformation of these sectors by upgrading the green and digital skills of their staff;
- Provide funding to pay workers from SMEs for their time devoted to training; and
- Encourage branch organisations to include new innovative firms (start-ups) involved in different transition processes in their organisations.

Annex I – Study Visits Participants

Study visit to Sweden

In terms of participants, the following stakeholders which have been involved in the projects joined to represent their organisations:

- Sébastien Combeaud – EC DG REFORM
- Helena Van Langenhove – Department of Work and Social Economy (DWSE)
- Lisa Popelier - DWSE
- Kim Geerts - DWSE
- An Katrien Sodermans - DWSE
- Tom Janssen – Department of the environment (centre for sustainable education)
- Katrijn Sieben - Circular Flanders
- Jean-Luc Fasseur - Social Economic Council of Flanders

The study visit took place from 9 to 10 May 2022 in Gothenburg, Sweden where we exchanged views on and practices for stimulating green skills with the following organisations:

Gothenburg Region

- Helene Stensson (Process leader at technical college and competence adviser).
- Viveka Blomgren (Project Manager High School Days and Future Skills).

The Gothenburg Region is a municipal association, which functions as an authority on behalf of the municipalities in some areas. Among others, it functions as a collaborative body in the labour market, environment and community building, social welfare including municipal health care, education and business. In the various networks, officials of the member municipalities meet to exchange experiences, develop ideas and decide on joint initiatives, based on the goals that the politicians have agreed on.

Swedish Public Employment Services (Arbetsförmedlingen)

- Fredrik Mortberg (Head of Labour market unit, Dept of Analysis).
- Dennis Drummond (Operations coordinator, unit Regional support Väst).
- Eva Wettermark (Head of branch office).

The goal of the Swedish Public Employment Services is to bring together those looking for employees with those looking for jobs as efficiently as possible. An important task for of the Service is also to equip those who are far from the labour market.

Business Region

- Anna-Lena Johansson (Head of Competence Management and Regional Cooperation).

Business Region Gothenburg is responsible for business development in the City of Gothenburg and represents 13 municipalities in the region. It wants to contribute to creating more jobs and thereby achieve sustainable growth in the Gothenburg region's business life. It offers knowledge and contacts that create conditions for those who want to start, establish or develop companies in the region.

European Social Fund Council

- Ninon Shenaz (regional coordinator).

The Council finances projects that work with skills development, employment measures and integration initiatives. Activities aim to reduce unemployment and exclusion, to strengthen Sweden's long-term

supply of skills and growth and to increase cohesion within the EU. Ninon will talk about projects, results and lessons learned.

Chalmers Industriteknik

- Åsa Wahlström (business area manager - authorities and industry organizations, Associate Professor Lund University).

Chalmers Industriteknik is a research and development organization with a focus on innovation for a sustainable society. Åsa, is employed by its subsidiary CIT Energy Management.

Volvo Group University (VGU)

- Fredrik Elieson (Vice-President VGU).

Volvo Group University presents itself as a centre for learning and competence development easily accessible to all of its employees, offering training in a wide range of topics.

YRGO and Bräckegymnasiet

- Erica Steen (principle);
- Benny Olausson (principal); and
- 2 other teachers.

Both are vocational schools with different programmes.

Study visit to France

In terms of participants, the following stakeholders which have been involved in the projects joined to represent their organisations:

- Sébastien Combeaud – EC DG REFORM
- Helena Van Langenhove – Department of Work and Social Economy (DWSE)
- Elke Segers – DWSE
- Cornelia Vandenberghe – DWSE
- Tom Janssen – Department of the environment (centre for sustainable education)
- An De Coen – Social and Economic Council of Flanders (SERV)
- Matthias Multani – HIVA KU Leuven
- Eddy Demeerseman – Flemish Council for Education (VLOR)
- Sofie Bogaerts – ESF Flanders

The study visit took place on the 9th of September 2022 in Paris, France where we exchanged views on and practices for stimulating green skills with the organisations presented below.

CFE-CGC

- Madeleine Gilbert and François Hommeril

Confederation of Management – General Confederation of Executives (Confédération française de l'encadrement - Confédération générale des cadres) CFE-CGC is one of the five major French confederations of trade unions. It organizes unions for professional employees, with higher education and/or in management or executive positions. The CFE-CGC campaigns for an ecologically just transition and is committed on a daily basis to training its activists and making things happen.
During a recent conference Madeleine Gilbert emphasised the relevance of the union to allow employees to work on the green trantision. On this topic, CFE-CGC has developed three main themes: i) the role of unions as a green transformation force; ii) the consequences of the transitional process on

jobs and trades; and iii) the consequences and challenges of the climate and resilience law of August 2021, in particular on the environmental prerogatives of the Social and Economic Committee (CSE).

CGT

- Véronique Martin

The General Confederation of Labour (*Confédération Générale du Travail*, CGT) is a national trade union center. It is the first of the five major French confederations of trade unions. It is the largest in terms of votes (32.1% at the 2002 professional election, 34.0% in the 2008 election), and second largest in terms of membership numbers.

Alliance Ville Emploi

- Lucie Becdelièvre and Narjisse Ben Moussa

Employment Cities Alliance (Alliance Villes Emploi) is a national association whose members are local authorities (mainly inter-municipalities) and the structures they support, involved in employment and integration issues. AVE deals with the green transition through various activities:

- Awareness-raising actions and discovery of ecological transition professions aimed at people far from employment;
- The setting up of integration projects or other employment stages linked to sustainable development (repair, reuse, market gardening, urban or sustainable agriculture, collection and treatment of bio-waste);
- Support for the recruitment and training of companies working for the ecological transition;
- Support for the implementation of social clauses for companies in the green economy sector;
- AVE participates in European projects aimed at developing and testing methods and tools to support skills development and stimulate demand for construction and renovation work.

ADEME

- Thomas Gaudin

The French Environment and Energy Management Agency (Agence de l'environnement et de la maîtrise de l'énergie) was established under the supervision of the Ministry for an Ecological Transition and Territorial Cohesion, the Ministry for the Energy Transition and the Ministry for Higher Education and Research. As an ecological transition agency, its mission is to accelerate the transition to a more sober and supportive, job-generating, humane and harmonious society. To this end, it supports innovation, from research to the application and sharing of solutions.

Afpa

- Christophe Sadok, Alex Lenoir, Fulbert Herve, Ralph Lesca and Rajaa Bonnamour

The French Association for Vocational Training (Agence nationale pour la formation professionnelle des adultes) is a major operator of vocational training in France and Europe. As a national agency since 2017, Afpa plays a crucial role in professional and social integration by supporting job seekers and employees, from training to employment: vocational integration; reskilling; upskilling; and personal, professional and career development. To support social inclusion public policies, Afpa creates and coordinates programs at the regional, national and European level that foster the integration of persons facing particular difficulties on the labour market, such as early school leavers, people with disabilities, immigrants and ethnic minorities by developing their employability, increasing job opportunities and preventing all forms of discrimination. Over the last 10 years, Afpa has increasingly offered services to deal with the green transition.

Onemev

- Sohpie Margontier

The National Observatory for Jobs and Occupations of the Green Economy (Observatoire national des emplois et métiers de l'économie verte) was set up to identify and better understand jobs in the green economy in a context of reorientation of the French economic model. It produces methods, references and analyses for the dissemination of knowledge on jobs and professions in the green economy. The work carried out revolves around two main areas of work: i) Observation, methods and quantification of the green economy: definition of perimeters, methodologies and costing of jobs in the green economy, analysis of the labour market, recruitment and mobility; and ii) Identification of skills and analysis of the employment-training relationship in the context of a green economy.

France Stratégie

- Marie-Cécile Milliat

France Stratégie is an autonomous institution placed under the Prime Minister. It contributes to public action through its analyses and its proposals. It drives public debate and sheds light on collective choices on social, economic and environmental issues. It also produces evaluations of public policies at the request of the government. The results of its work are intended for public authorities, civil society and citizens.

Annex II – Peer Exchange Participants

On the 17th of February 2023 an online peer exchange was organised with representatives from five different countries and two international organisations. The aim was to have a knowledge exchange with experts from EU Member States on the challenges faced to develop skills needed for the green transition, especially regarding the aspect of skills 'mobilisation' and on how proactive approaches for the skills and jobs transitions can be stimulated in terms of workforce and resource planning. The main thematic focus of this exchange was on good practices for **green skills development within the construction sector**. This sector is already facing significant skills shortages and a great need exists to 'green' the sector in Flanders and the guest countries.

The following participants joined the peer exchange:

Organisation	Names
Ireland speaker - Technological University of the Shannon	Gloria Callinan
Sweden speaker - Swedish Installation Federation	Pär Lundström
France speaker – Alliance Ville Emploi	Narjisse Ben Moussa
Netherlands speaker – ISSO	Jan Cromwijk
Flanders speaker – Department of Work and Social Economy	Kim Geerts
Ireland - Laois & Offaly ETB (VET)	Padraig Boland, Jolene Hall
OECD	Francesca Borgonovi
DG EMPL	Tim Schreiber
DG REFORM	Sébastien Combeaud
Department of Work and Social Economy	Elke Segers, Helena Van Langehove, Ella Tribout, Lisa Popelier, Kim Geerts
Vlaanderen Circulair – OVAM	Stein Janssens
Department of Education	Jana Laga, Veerle Vandeput
Flemish Climate and Energy Agency	Sara Ochelen
Department of Agriculture and Fisheries	Riccy Focke
Syntrum	Wendy Danko
Trinomics	Tessa Zell, Erik Klaassens, Pavla Cihlarova, Maja Lardot, Koen Rademaekers
Ockham IPS	Simon Broek

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