

## GREEN GROWTH, JOBS AND SOCIAL IMPACTS FACT SHEET

### Key messages

- The EU's **environmental economy** is small (2.2% of GDP in 2017) but growing, **outperforming the overall economy** (3.2% annual growth vs. 1.4% in 2000-2017).
- The 3.1 million **green jobs** in 2000 grew to **4.2 million** in 2017.
- **39% of the green sector's value added relates to energy management**, 27% to waste management, 13% to wastewater - with energy also driving the growth of green jobs.
- The EU-27's **total expenditure on environmental protection** (households, firms, governments) was EUR 269.1 billion in 2019, 1.9% of GDP, with EUR 51.5 billion on capital (investments).

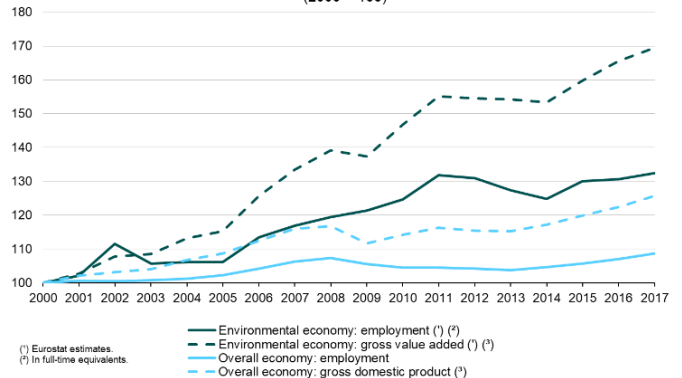
### Background

The **environmental- or green economy**, is a growing segment of the overall economy, covering producers of goods and services across the economy focusing on environmental protection and resource management. Environmental protection aims to prevent, minimise, eliminate or treat pollution and other degradation, while resource management deals with efficiencies, safeguarding resource stocks.

### The EU-27's environmental economy

In 2017, the **environmental economy generated** 698 billion euros output and 287 billion euros value added, 2.2% of GDP. The environmental economy **grew rapidly in 2000-2017, outperforming the overall economy** – in accordance with earlier prognoses.<sup>1</sup> Its nominal **value added** (of 129.6 billion euros in 2000) more than doubled, while real growth (inflation-adjusted) was also significant, 69%, corresponding to 3.2% per annum on average – whereas the overall economy expanded by 26% in real terms during the period (1.4% annually). Most of the green growth took place in 2000-2011 (4% p.a.), slowed then by the economic downturn and increasing global competition, with stagnation until 2014.<sup>2</sup> The **green sector's contribution to GDP increased** in the period: from 1.6% in 2000 to 2.2% by 2017. **Employment** in the environmental sector also grew much faster than in the overall economy (by 32% between 2000-2016 versus 9% overall), due to the green sector's expansion up to 2011, with a pattern of increasing green jobs by close to 3% a year (on average). The 3.2 million green jobs (full-time equivalents) of 2000 rose to around 4.1 million by 2011, and except 2013-14, it mostly stayed there since then. Some invigoration was observable in 2017, as the number of green jobs reached 4.15 million.

Development of the environmental economy and the overall economy, EU-27, 2000-2017 (2000 = 100)



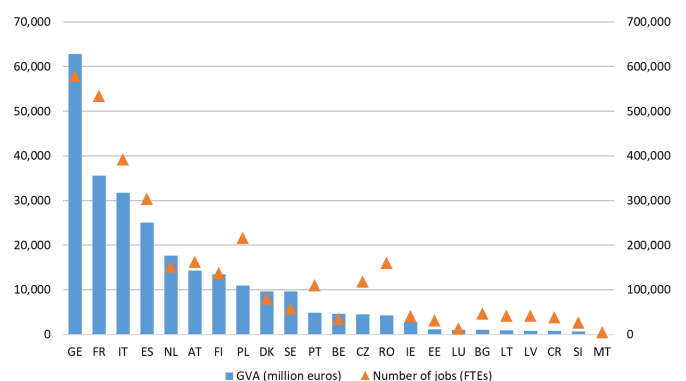
### Composition of green growth

By NACE activity, 40% of the green value added was generated in energy and water supply, sewerage and waste services (NACE D, E), 21% in construction, 19% in services, 12% in mining, quarrying and manufacturing and 7% in agriculture, forestry and fishing in 2017. By environmental domain (across NACE), 39% of the total green value added relates to energy management (doubling share since 2000), 27% to waste-, 13% to wastewater and 17% to other environmental protection. By domain groups, the **environmental protection** grew (with around 3% annual growth) to EUR 166 billion in 2017 (1.3% of GDP), compared to EUR 99 billion in 2000. **Resource management** started lower (EUR 31 billion, 0.4% of GDP), but with a more rapid growth (over 8% per annum), it reached EUR 121 billion (0.9% of GDP) by 2017, via the expansion of renewables and energy saving.

### Green economy by Member State

The EU-27's environmental economy shows concentration. 4 countries with the highest gross value added (Germany, Italy, France) account for over half of the EU-27 total. By Member State in 2017, top EU-27 green employers were Germany and France (both with over 0.5 million green jobs), followed by Italy and Spain (with 300-400,000 green jobs each).<sup>3</sup> This correlates well with the share in the value added, while for some countries (Poland, France, Romania) they are different, likely due to wider agricultural/forestry jobs.

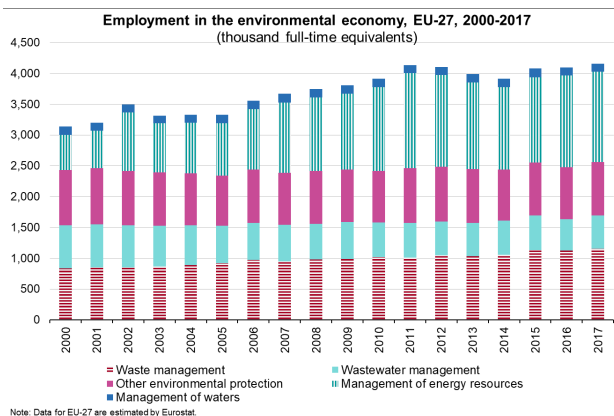
Key environmental economy data by EU-27 Member State, 2017



## Green jobs, in detail

Between 2000-2017, **green jobs mostly grew in the energy sector**: renewable technologies (wind, solar) and heat/energy saving added 0.9 million jobs in the period, with further 319,000 additional jobs in waste management, with some decrease in other environmental protection (-29,000 jobs). Wastewater jobs decreased by 162,000, while for water management it did not change (stable around 130-140,000 FTEs). The largest green employment domain was energy management (35%), followed by waste management (28%), other environmental protection (21%) and wastewater (13%).

In **renewable energy**, the EU had 1.2 million jobs in 2017-18. Of this, solid biomass and wind power provided most jobs, 387,000 and 314,000. In liquid biofuels, the EU had 208,000, in solar PV 96,000 jobs. The EU remains strong in wind industry: Germany, France and Belgium were among the 10 countries worldwide, adding most new capacity in 2017.<sup>4</sup> **Wider definitions** of green jobs, with indirect employment in other sectors making intermediate goods for the eco-industry, organic farming, eco-tourism suggest a higher green employment, up to 20 million jobs, 5% of working population<sup>5</sup>.



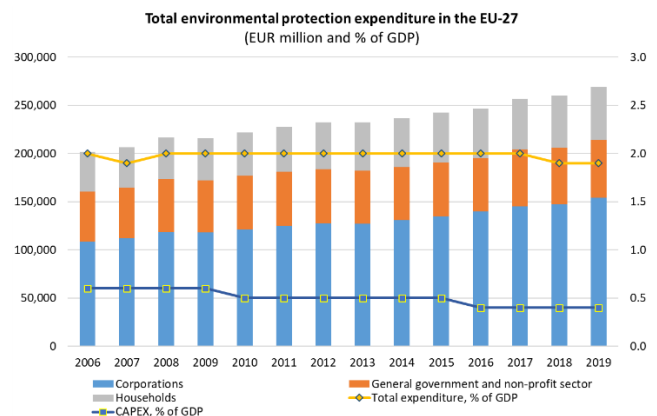
## EU-27 environmental protection expenditure

Total **environmental protection expenditure** was 269.1 billion euros in 2019. Current amounts have increased with time, but being stable at ca. 2% of GDP despite more ambitious environmental policies, likely due to innovation and efficiencies in responding to legislation. In 2019, 57% of the environmental protection expenditure belonged to **corporations** (mostly specialist producers for wastewater and waste), 22% to governments and 21% to households.<sup>6</sup> **Capital expenditure** in 2019 amounted to 51.5 billion euros in the EU-27 (1/5 of the total), operating expenditure and final consumption are around 40% each. 57% of capital investment is made by firms, 43% by general governments. The share of environmental protection investments in total investments of firms is low, 1.7% in 2019, while it's 4.9% for governments - mostly without resource management (energy, materials etc.). Post-2008- and 2015, **environmental protection investments fell**, in absolute terms and compared to GDP, especially in manufacturing, without full recovery to date.

The **COVID-19 recovery package**<sup>7</sup> assessed the economic and social impacts of the crisis that shocks both the supply- and the demand side of the economy, leading to losses in incomes, capital and in capacity to invest which set back growth, raise unemployment

and slow the transition to a greener, more innovative economy – implying the need for a strong and co-ordinated economic response at EU level to support crisis repair and recovery efforts as well as longer-term investment challenges in specific policies and sectors. It found that **additional investments necessary to achieve the green transition** amount to EUR 470 billion, and the digital transformation to EUR 125 billion per annum, and confirmed that the green transition investment gap covers not only the 2030 climate and energy targets (EUR 240 billion p.a.), but also sustainable transport (EUR 100 billion p.a.) and **broader environmental objectives** (EUR 130 billion p.a.)<sup>8</sup> **Climate adaptation**, not included in above estimates, are also be significant, costing EUR 35-62 billion (narrower scope) or EUR 158-518 billion (wider scope) per year.<sup>9</sup>

**Re-assessed environmental investment needs** are estimated to range EUR 80-130 billion a year (medium estimate: 100 billion euros p.a.). A **broad categorisation of environmental objectives**, similar as in the Sustainable Finance Taxonomy, covering both environmental protection- and resources, shows that half of the environmental investment gap (around 50 billion euros a year) relates to pollution, 25-30 billion to water, 5-20 billion to circular economy, 7-15 billion to biodiversity and ecosystems and around 3-10 billion to R&D.<sup>10</sup>



## Global green economy

Early figures put the **global market** of environmental goods and services (eco-industries) at EUR 1.0-1.1 trillion in 2010, with the EU capturing 1/3, with major competitors in China, Japan and the US. In 2010 the EU was the 3<sup>rd</sup> largest global green exporter – after China and Japan and the global market was estimated to double by 2020 and triple by 2030. Optimistic projections foresee that by 2030, achieving global sustainability goals may create USD 12 trillion in market opportunities (savings and revenue) in four (environment-related) economic areas: food and agriculture, cities, energy and materials, health and well-being – and 380 million new jobs.<sup>11</sup>

**Global employment** in renewable energy was 6.9 million jobs in 2012, growing to 11.5 million by 2019, with women holding 32% of that. Of the total, 38% belonged to China, and 63% to Asia in total. By industry, 3.8 million jobs were found in the solar photovoltaic (PV) industry and 3.6 million in bioenergy. Within bioenergy, liquid biofuel had 2.5-, solid biomass 0.8-, biogas 0.3 million jobs. Hydropower had 2 million jobs, wind energy 1.2 million, solar heating/cooling 0.8 million.<sup>12</sup> It was projected that limiting global warming to 2 °C, would raise green employment to 24 million by 2030 (with 6 million

jobs lost in traditional energy-related/intensive sectors): 18 million in energy efficiency and electric vehicles and 6 million in circular economy. By 2050, the transition to a green, low-carbon economy can generate 60 million new, green jobs globally.<sup>13</sup>

## Challenges and potential

A **just transition** requires support in affected sectors, adapted labour policies, mobility, right educational frameworks to close occupation shortages and skill gaps (New Skills Agenda, Green Employment Initiative)<sup>14</sup>. Significant bottlenecks are in renewables and resource efficiency (engineering, installation, audit etc.), electric engineering, ICT, materials and construction. Skilled workforce is also key to the **global competition for production**, that has fundamental effect on the long-term success of the EU's green sector. **Large-scale investments** are needed to protect the environment/resources and to exploit green growth potentials. **Positive links** between environmental and economic performance are likely to strengthen in the green transition, with significant green investment needs ranging 2-8% of GDP<sup>15</sup>.

Earlier estimates suggested overall positive but moderate **socio-economic impacts** of green policies, e.g. climate/energy policies adding less than 1% to GDP and 0.5% to employment (ca. 1 million jobs) by 2030<sup>16</sup> and resource efficiency similarly adding up to 1% and 0.5% to those, respectively<sup>17</sup>, while recent evidence shows more significant impacts: resource efficiency and circularity combined can

increase GDP by an additional 7% and employment by 1% (2 million jobs).<sup>18</sup> Co-benefits are also important. Climate/energy measures can lead to health cost savings of EUR 38 billion-, avoided CO<sub>2</sub> damage costs up to 16-74 billion-, reduced pollution control costs of 50 billion-, 250 billion lower climate change adaptation costs per year by 2050. Resource and circularity measures combined can bring total annual benefits of EUR 1.8 trillion (0.6 billion in primary resource cost-saving and 1.2 trillion in non-resource and externality benefits), raising EU households' disposable income by 11% by 2030. Public financial support in circular economy sectors can leverage an investment value of EUR 320 billion over the coming years.

## EU Green Deal and green recovery

The EU reinforced sustainability ambitions via the **European Green Deal** (EGD) with a European Climate Law for climate neutrality by 2050, a new Circular Economy Action Plan, a new Biodiversity- and Farm to Fork Strategy and a Zero Pollution Action Plan to put Europe on a path towards sustainability by 2030. Green transition is a key priority, COVID-19 recovery measures also need to support long-term goals ('build back better'), requiring to scale up reforms and implementation, to comply with environmental acquis and to live up to the green oath of the European Green Deal to 'do no harm'. The **2021-27 EU budget and the Next Generation EU** fund will allocate over 1.8 trillion euros to support the EU policies and the recovery in 2021-27, with 30% on climate and environment.

- 1 Tapping into the job creation potential of the green economy. COM(2014)446.
- 2 Environmental economy – employment and growth, Statistics Explained, Eurostat, 2018, 2019, 2020.
- 3 Eurostat EGSS database: env\_ac\_egss1 (Oct. 2020)
- 4 Renewable Energy and Jobs. IRENA, 2019.
- 5 The number jobs dependent on the environment and resource efficiency improvements. Ecorys (2012).
- 6 Environmental protection expenditure (EPEA) accounts. Eurostat database, env\_ac\_eepea dataset.
- 7 [https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/recovery-plan-europe\\_en](https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/recovery-plan-europe_en)
- 8 [https://ec.europa.eu/info/sites/info/files/economy-finance/assessment\\_of\\_economic\\_and\\_investment\\_needs.pdf](https://ec.europa.eu/info/sites/info/files/economy-finance/assessment_of_economic_and_investment_needs.pdf)
- 9 SWD(2018)292. Impact assessment accompanying the Proposal for the LIFE Regulation (COM(2018)385).
- 10 Environmental investment needs and financing in the EU's green transition. DG ENV, July 2020.
- 11 Better business, better world. Business & Sustainable Development Commission, 2017.
- 12 Renewable energy and jobs. Annual Review 2020. IRENA
- 13 Greening with jobs. World employment social outlook. ILO, 2018.
- 14 <https://eur-lex.europa.eu/legal-content/GA/TXT/?uri=CELEX:52015IP0264>
- 15 Beyond the Gap. World Bank Group, 2019.
- 16 Macro-economic impacts of the low carbon transition. Ernst & Young, 2014., The macro-level and sectoral impacts of energy efficiency policies. Cambridge Econometrics, 2017.
- 17 Links between production, the environment and environmental policy. Cambridge Econometrics, 2019.
- 18 Growth within: A circular economy vision for a competitive Europe. EMF and McKinsey, 2015.

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