

The European Green Deal

Before we understand what the European Green Deal is, we have to go back to the root that caused this deal to even be made.

According to Frans Timmermans- Vice President of the European Commission, the European Union would not have a green deal to combat climate change if Swedish environmental activist Greta Thunberg had not played a part. Greta Thunberg is a Swedish environmental activist who is known for challenging world leaders to take immediate action for climate change mitigation.

Timmermans, the European Commission's Executive Vice-President for the Green Deal, spoke on the EU's efforts to combat the climate issue, warning of severe consequences if the current green transition fails.

What matters is that we face our population with the cost of transition, as well as the cost of non-transition, which will be enormous and result in unimaginable human suffering if we do not change our ways.

The Climate change summit COP26, produced a pact that was both celebrated for its groundbreaking nature and criticised for its sluggish wording after days of furious back and forth and last-minute discussions. The European Parliament and EU's 27 member states are now debating Fit For 55, a large legislative package aimed at reducing greenhouse gas emissions by at least 55% by the end of this decade. The initiative will necessitate significant changes in the European economy as well as additional yearly investments of approximately €520 billion.

Most of the 13 draft regulations included in Fit For 55, according to the Vice-President, will be adopted before the next UN conference, COP27, which will be held in Sharm El-Sheikh, Egypt, in late 2022.

The completion of the EU taxonomy, a public rulebook that defines sustainable projects and activities and acts as advice for governments and private investors, is one of the crucial decisions Timmermans and his colleagues Commissioners must make. Many industries, such as wind power, solar, geothermal, and hydrogen, have already been labelled as "green," while natural gas and nuclear energy have yet to be labelled due to major disputes among member states. France is heading the pro-nuclear squad, with the support of Eastern nations, while Germany is recruiting like-minded allies to sabotage the effort.

According to recent media reports and public announcements from EU officials, the two sources would eventually be classified as sustainable, in order to appease all sides of the dispute, a scenario that environmental groups have passionately opposed, claiming that the choice would amount to greenwashing.

What the EU has to do is assist countries in making the transition from coal to renewables. However, some countries are unable to do this in a single step. Natural gas will be required as a transitional energy source. On nuclear power, the Vice President emphasised that it has the "great" advantage of not emitting greenhouse gases, but he cautioned against the high cost. The cost of constructing nuclear power plants continues to rise, while the cost of developing renewable energy resources is rapidly declining. Investing in renewables does not require any public funds, but to invest in nuclear power, you'll need a lot of public money.

What is the EU Green Deal

The EU's Green Deal is the primary new growth plan for transforming the EU economy to a more sustainable model. The EU Green Deal, which was presented in December 2019, has as its main goal for the EU to become the first climate-neutral continent by 2050, resulting in a cleaner environment, more affordable energy, smarter transportation, new employment, and a higher overall quality of life. The EU Green Deal has a number of financial structures in place, totaling more than €1 trillion. This funding will go toward policy reforms that are necessary for the EU's economic development and climate neutrality.

Funding the EU Green Deal

The EU Green Deal Investment Plan lays out the proposed finance for the EU Green Deal. It consists of two major funding sources totaling €1 trillion. The EU budget and the EU Emissions Trading System will provide more than half of the budget, €528 billion. The rest will come from the InvestEU initiative, which will pool €279 billion from the public and commercial sectors, as well as €114 billion in state co-financing, until 2030.

It will give an EU budget guarantee that will allow the EIB Group and others to participate in higher-risk projects, allowing private investment to flourish. The European Innovation Council has also set aside a budget of €300 million to invest in market-creating innovation that support the EU Green Deal's aims.

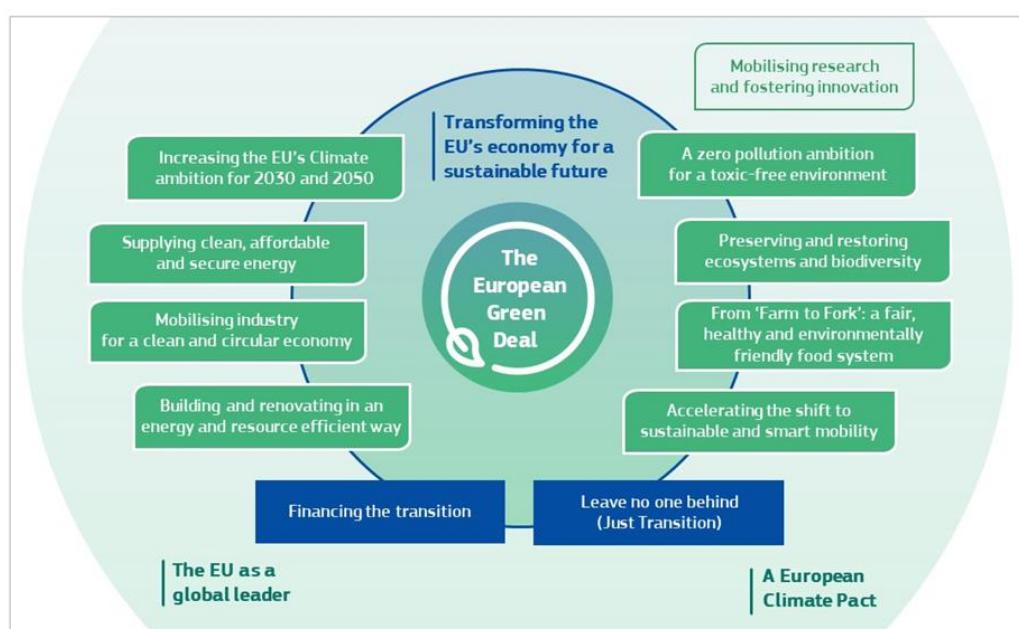
The EU Green Deal recognizes that transition can only be successful if it is undertaken in a fair and inclusive manner. As a result, a Just Transition Mechanism is proposed, which would focus solely on the areas and industries most affected by the transition. It

generates €100 billion in funding by combining the EU budget with the InvestEU program. This will be offered to areas and industries that rely on fossil fuels or carbon-intensive processes for their livelihood.

Elements of the EU Green Deal

The main elements of the EU Green Deal are:

- Climate action.
- Clean energy.
- Sustainable industry.
- Buildings and renovations.
- Sustainable mobility.
- Eliminating pollution.
- Farm to Fork.
- Preserving biodiversity.
- Research and development.
- Preventing unfair competition from carbon leakage.



Climate action

Between 1990 and 2018, greenhouse gas emissions in the EU were reduced by 23 per cent. A central objective of the EU Green Deal is to set out the trajectory for the EU to be climate neutral by 2050. As a milestone towards this target, the EU Commission proposed a 2030 target to reduce greenhouse gas emissions by 55 per cent compared to 1990. This 2030 target is proposed to be reflected in a European Climate Law, which will also enshrine the 2050 climate neutrality objective of the EU Green Deal in legislation.

The European Climate Law requires that all EU policies contribute to achieving the EU Green Deal objective. As a result, the EU Commission is reviewing every EU law to ensure its alignment with the EU emission reduction targets, under an exercise termed the “Fit for 55 package”. This lengthy process has already begun. A selection of the key legislation that the EU Commission proposes to revise in light of the revised emissions reduction target is:

- Ø the Renewable Energy Directive;
- Ø the Energy Efficiency Directive;
- Ø the Emissions Trading System;
- Ø the Effort Sharing Regulation;
- Ø the Land Use, Land Use Change and Forestry Regulation;
- Ø the Energy Performance of Buildings Directive; and
- Ø the Energy Taxation Directive.

This review is intended to be effective by the time Member States begin updating their national energy and climate plans in 2023, so that these plans reflect the new climate ambition.

Clean energy

The production and use of energy across economic sectors currently accounts for more than 75 per cent of the EU’s greenhouse gas emissions. The Clean Energy policy area aims to reduce this figure by developing a power sector based largely on renewable sources and an integrated, interconnected and digitalised EU energy market.

The offshore renewable energy strategy encourages the investment of almost €800 billion between now and 2050 in offshore energy infrastructure and research. This

should increase the EU's offshore wind capacity from its current level of 12 GW to 300 GW by 2050 and the EU's offshore ocean capacity from its current level of 13 MW to 40 GW by 2050.

The EU Hydrogen Strategy explores the potential of clean hydrogen to contribute to decarbonisation. The adopted strategy promotes clean hydrogen innovation and the installation of hydrogen electrolyzers. The strategy includes a target to install at least 6 GW of green hydrogen electrolyzers within the EU, producing up to 1 million tonnes of hydrogen by 2024. By 2030 the ambition is to install at least 40 GW of electrolyzers, producing up to 10 million tonnes of hydrogen in the EU.

The Clean energy for all Europeans package, will facilitate the strategy for energy system integration, which aims to improve the coordination of planning and operation of the energy system 'as a whole', across multiple energy carriers, infrastructure, and end uses. The EU institutions will discuss the strategy that outlines a vision to create a smarter, more integrated energy system.

A revision of the Trans-European Networks for Energy Regulation (the TEN-E Regulation) has also been proposed. The revised framework reflects the accelerated take-up of renewable energy sources, smart sector integration, the modernisation of the EU's cross-border energy infrastructure and mandatory sustainability criteria for all projects. Together, these EU initiatives will work in synergy to lay the foundation for the decarbonised EU energy system.

Sustainable industry

At present, industry accounts for 20 per cent of the EU's greenhouse gas emissions. The EU Green Deal therefore includes actions to strengthen the decarbonisation efforts, ranging from product sustainability to the supply of raw materials. The adopted Circular Economy Action Plan presents initiatives to increase the duration of a product in order to alleviate pressure on natural resources. It includes a Sustainable Products Policy, which regulates the improvement of product reusability, reparability, and integration of recycled contents. The aim of the adopted EU Industrial Strategy is to develop markets for climate neutral and circular products and to encourage the digital transition in the EU. The EU Green Deal notes that these measures are necessary to ensure the supply of the critical raw materials needed for clean technologies such as clean hydrogen, fuel cells and other alternative fuels, energy storage, and carbon capture, storage, and utilisation.

In relation to batteries, the European Commission's proposal for Sustainable batteries and a Regulation on batteries and waste batteries is seeking to strengthen the sustainability of supply chains and improve the recycling of industrial, automotive,

electric vehicle and portable batteries placed on the market in the EU. The proposals include enhanced recycling targets, carbon footprint reporting requirements, moving to carbon intensity restrictions, as well as mandatory supply chain due diligence.

Buildings and renovations

Buildings are responsible for approximately 40 percent of the EU's energy consumption and 36 percent of greenhouse gas emissions from energy. The objectives of the EU Green Deal require cleaner buildings and construction sectors. The Renovation Wave is a strategy to renovate buildings to increase their energy efficiency. It prioritises the decarbonisation of heating and cooling, tackling the worst performing building stock and the renovation of public buildings such as schools and hospitals. Energy efficiency in buildings will be a priority and the EU Commission will explore the possibility of including emissions from buildings in the EU Emissions Trading System (EU ETS).

The EU Commission is also reviewing the Construction Products Regulation, which sets the requirements for construction products in the Internal Market. A revised regulation has the potential to promote environmental goals and possibly product safety. In parallel, the EU Commission proposes to work on an open platform bringing together architects, engineers, and local authorities to address the barriers to renovation. It could target energy service companies that could roll out renovation, such as through energy performance contracting. The reforms are intended to optimise the development of innovative financing in the construction sector and the promotion of energy efficient investments in buildings.

Sustainable mobility

The Sustainable Mobility policy area comprises initiatives to reduce transport emissions, which account for 25 per cent of the EU's greenhouse gas emissions. The adopted Strategy for Sustainable and Smart Mobility lays the foundation for action to transform the EU transport sector, with the aim of a 90 per cent cut in emissions by 2050, delivered by a smart, competitive, safe, accessible, and affordable transport system. Increased capacity and decreased congestion and pollution could all be attained as a result of efforts to promote more sustainable means of transport. The strategy sets a number of targets to 2030 including:

- Ø at least 30 million zero-emission cars will be in operation on European roads;
- Ø 100 European cities will be climate neutral;
- Ø high-speed rail traffic will double across Europe;

- Ø scheduled collective travel for journeys under 500 km should be carbon neutral;
- Ø automated mobility will be deployed at large scale; and
- Ø zero-emission marine vessels will be market-ready, with further targets to 2035 and 2040.

To meet these objectives, several proposals for revised legislation are being considered. One aspect is the review of the Directive on the Deployment of Alternative Fuel Infrastructure, which sets the requirements for expanding the EU's network of recharging and refuelling stations for alternative vehicle fuels such as electric batteries and hydrogen. The Regulation setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles may also be revised considering the EU carbon neutrality target. The revision would entail stricter emissions standards for road vehicles. The EU Commission also plans a revision of the Regulation on the trans-European transport network (the TEN-T Regulation) and of the Directive on intelligent transport systems. This aims to increase the uptake of zero-emission vehicles, make sustainable alternative solutions and support digitalisation and automation.

Batteries will be important for electric vehicle deployment, as well as in energy system transformation. As a result, EU policy is also focused on sustainable battery supply chains covering the entire battery life cycle, including recycling and re-use. In its proposal for a Regulation on batteries and waste batteries, the European Commission is seeking to strengthen the sustainability of supply chains and improve the recycling of industrial, automotive, electric vehicle and portable batteries placed on the market in the EU.

The EU ETS has proved effective in the sectors in which it operates. Part of the EU Commission work plan includes the revision of the EU ETS rules for the aviation sector including a review of the proposals to reduce free allowances allocated to the sector. The update would implement the carbon offsetting and reduction scheme for international aviation. Moreover, the EU Commission proposes to extend the EU ETS to the maritime sector and, subject to impact assessment, to road transport.

Eliminating pollution

Pollution is the largest environmental cause of multiple mental and physical diseases, and of premature deaths. It is also a significant driver of biodiversity loss. Therefore, the EU Commission has proposed a Zero pollution action plan. This proposes that pollution elimination measures are incorporated into all policy developments and steps are taken to further decouple economic growth from the increase of pollution.

The action plan comprises three headline actions on eliminating pollution. Firstly, a Chemical strategy for sustainability to protect the environment against hazardous chemicals. Second, a Zero pollution action plan for water, air, and soil, to better prevent, remedy, monitor and report on pollution. Finally, the revision of measures to address pollution from large industrial installations to ensure that they are consistent with related EU Green Deal objectives. A revision of the Regulation on substances that deplete the ozone layer is also envisaged.

Farm to Fork

Food systems are responsible for around 21-37 per cent of global greenhouse gas emissions and use up significant natural resources. The Farm to Fork strategy aims to address these environmental issues as well as fairness, sustainability of the food system and the health of Europeans. The strategy will focus on reducing waste, and transforming the manufacturing, processing, retailing, packaging, and transportation of food.

The Farm to Fork strategy proposes to spend €10 billion on research and innovation on food, bioeconomy, natural resources, agriculture, fisheries, aquaculture, and the environment, as well as digital technologies and nature-based solutions for agri-food, funded by Horizon Europe, the EU's research, and innovation framework programme. EU policies and legislation will focus on trade policy to obtain commitments from third countries in areas such as animal welfare, the use of pesticides and the fight against antimicrobial resistance. The Commission and food-chain stakeholders are developing an EU Code of conduct for responsible business and marketing practice as well as seeking commitments from food companies and organisations to start taking steps towards improving health, sustainability, and the environment. Reform of the common agricultural policy (CAP) is also envisaged.

Separately, the EU Commission has proposed a Strategy to reduce methane emissions. Methane is the second biggest contributor to climate change after carbon dioxide and contributes to air pollution. Reducing methane emissions requires a cross sector approach: in the EU, 53 per cent of anthropogenic methane emissions come from agriculture, 26 per cent from waste and 19 per cent from energy. The Methane strategy focuses on adequate reporting and opportunities for biogas production, as well as specific measures in the energy, agriculture, and waste sectors.

Preserving biodiversity

In the last 40 years, the population of wild species has fallen by 60 per cent due to human activities. The EU Biodiversity strategy for 2030 identifies the key drivers in biodiversity loss as changes in land and sea use, overexploitation, climate change,

pollution, and invasive alien species. Biodiversity loss and climate change are intrinsically linked, and nature-based solutions will play an important role in mitigating, and adapting to, climate change. The European Commission identifies that the industries highly dependent on biodiversity are the construction, agriculture and food and drink sectors.

The EU Biodiversity strategy will work in tandem with the Farm to Fork strategy by focussing on restoring forests, soils and wetlands and creating green spaces in cities. To address legislative gaps that hinder improving biodiversity standards across the EU, the EU will implement a new biodiversity governance framework. This framework includes imposing legally binding nature-restoration targets to restore degraded ecosystems, to be achieved by fully implementing the EU Pollinators initiative and the Habitats Directive, as well as via the CAP.

The European Commission estimates that €20 billion per year is needed to fund the biodiversity strategy. This will require the use of a combination of public and private funding on a national and EU level as well as from the EU budget. Part of the Renewed Sustainable Finance Strategy will focus on ensuring the financial system contributes to mitigating existing and future risks to biodiversity, recognising the risk that biodiversity loss poses to the financial prospects of many sectors of the economy.

Research and development

Research and development underpin each element of the EU Green Deal. Many of the EU Green Deal initiatives require harnessing new technologies and transforming financial models and supply chains. Many research and development initiatives will be funded by Horizon Europe, which has pledged over 35 percent of its €95.5 billion budget to achieving EU climate objectives. Under Horizon Europe, the EU will form green partnerships with various industries and its member states to focus on key areas such as batteries, clean hydrogen, low-carbon steel, the built environment, and biodiversity.

Preventing unfair competition from carbon leakage

The EU Green Deal will require significant reorientation of the EU economy towards a low carbon model. This brings with it the risk of carbon leakage. The EU Commission has identified this as the risk that either production is transferred from the EU to other countries with lower ambition for emission reduction, or that EU products are replaced by more carbon-intensive imports. Carbon leakage is currently controlled by the free allocation of allowances under the EU ETS, or compensation for energy intensive industries impacted by higher electricity costs as a result of carbon pricing under the EU ETS. The EU Commission is therefore proposing a Carbon Border Adjustment

Mechanism to ensure that the price of imports reflects more accurately their carbon content. This measure is proposed to be designed to comply with World Trade Organization rules and other international obligations of the EU.

TNO participates in two proposals for European Green Deal

On Thursday, May 27th 2021, the European Commission released the evaluations and funding decisions for the Green Deal call “European Research Infrastructures capacities and services to address European Green Deal challenges”. TNO participates in two successful proposals

The H2020 project proposal ‘Pilot Application in Urban Landscapes – towards integrated city observatories for greenhouse gases’ (PAUL) has been approved for funding by the EC.

PAUL aims to support the European Green Deal by solving specific scientific and technological problems related to the observation and verification of greenhouse gas (GHG) emissions from densely populated urban landscapes. The EC initiated this project as a pilot for urban GHG monitoring because cities are fossil fuel emissions hotspots and are therefore at the heart of emission reduction efforts globally.

The 4-year project will be coordinated by the ICOS-ERIC (the Integrated Carbon Observation System) based in Sweden. TNO-CAS main tasks will be to lead WP1 (city information; including city emission inventories) and in WP2 to lead the task on emission modelling. Pilot cities are Munich, Zurich and Paris. Rotterdam will be an associated city included in the so-called PAUL City Network, with [TNO-CAS](#) as its liaison. Once the PAUL concept is proven successful the idea is that this can be rolled out over Europe with, for example, an ICOS-city monitoring location in every member state. PAUL will design, in co-creation with users, specific city services around the GHG observations and monitoring.

Using its data and modelling expertise TNO can play a role in designing and maintaining operational services for cities providing better insights in urban fluxes of GHG and climate action plans.

Data Challenges and societal needs concerning air quality

Research Infrastructures Services Reinforcing Air Quality Monitoring Capacities in European Urban & Industrial Areas (RI-URBANS) will develop Service Tools that will provide novel insights into spatio-temporal variability of air quality parameters, population exposure and air quality health interactions.

This will enable us to reduce air pollution in European cities and industrial hotspots. The project takes on board advanced research-driven Air Quality (AQ) observations at selected European pilot cities including the Dutch Randstad region. Thus, the proposal responds to the urgent needs to substantially reduce air pollution across the EU and to engage in a strategy for reducing the health impacts of air pollution by developing and enhancing synergies between Air Quality Monitoring Networks (AQMNs) and research Infrastructures in the atmospheric domain.

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