Future climate and energy policy - a Strategy for long-term EU greenhouse gas emissions reductions

Fields marked with * are mandatory.

Introduction

Climate change is happening and without further global action to mitigate it, temperatures will rise within this century well beyond a 2°Celsius compared to pre-industrial times. This will have major impacts on our economies and societies. In order to prevent this, 178 global partners cooperating under the United Nations Framework Convention on Climate Change (UNFCCC) have ratified the Paris Agreement that calls upon all countries to keep global temperature increase to well below 2°C, and to pursue efforts to limit the increase to 1.5°C above pre-industrial levels. Parties to the Paris Agreement are to communicate by 2020 their long-term low greenhouse gas emission development strategies.

In March, the European Council invited the Commission to present a proposal for a strategy for long-term EU greenhouse gas emissions reductions in accordance with the Paris Agreement, taking into account the national plans. The European Parliament made a similar request.

The EU is on track to achieve its 2020 targets and is currently putting in place policies to reduce greenhouse gas emissions by at least 40% in 2030 and achieve high level of ambition in energy efficiency and renewable energy (the so called energy and climate framework for 2030). The policies, legislative instruments and support programmes from the European budget will put the EU on a trajectory compatible with the Paris Agreement, but further measures are needed for the time after 2030.

The EU has currently an objective in the context of necessary reductions by developed countries as a group, to reduce emissions by 80-95% by 2050 compared to 1990 levels.

Delivering the Paris Agreement will require a worldwide transition towards a global economy that will not further affect the climate in the second half of the century.

To pursue these latter objectives, the EU's long term strategy should put forward a vision for the mid-century and how the European Union can help protect the planet, defend its people and empower its economy. The EU's new long term strategy should describe economy-wide pathways with various options for decarbonisation and their implications on technology choices and socioeconomic factors.

The strategy will reflect on a long-term vision of a modern European economy working for all Europeans. Studies and stakeholder input will contribute to the formulation of this vision and help explain the choices to be made. The strategy should reflect on the essential opportunities and challenges stemming from the

long-term decarbonisation and clean energy transition of the EU:

- modernising the economy;
- improving citizens' quality of life;
- ensuring fair transition and tackling social challenges;
- reindustrialising Europe through digital, circular and low carbon innovation and clean mobility;
- promoting free, fair and sustainable global competition for markets, trade and investments; and
- maintaining the EU's global leadership position on key geostrategic and security issues.

The strategy will analyse cost-efficient scenarios towards decarbonisation in line with the Paris Agreement underpinned by holistic analysis of transition options across all key sectors of the economy. This includes a wide variety of sectors, starting with the central role of energy, buildings, transport and mobility, industrial production and the provision of services, waste, agriculture and land-use, as well as the use of natural resources. It will examine the potential and implications of the deployment of innovative technologies, sectoral integration, and of facilitating alternative choices for consumers. It will examine implications for security of supply, investments, competitiveness and socio-economic factors, such as economic growth and job creation, also considering the impacts on citizens, businesses. Regions that stand to be negatively affected by decarbonisation should be supported making this transition just and socially fair.

The visions and reflections of stakeholders involved from all sectors of the economy and society on how to reach the EU's ambition will be an important input into this process. Therefore, the European Commission is very much interested in your views on a strategy for long-term greenhouse gas emissions reductions for the European Union. Please take a moment to fill in our questionnaire. We welcome contributions from the general public, stakeholders and authorities alike. Your views will help to enrich our assessment of what the EU should do in order to meet its commitment under the Paris Agreement.

Guidance on the questionnaire

After a few introductory questions related to your general profile in section 1, the questionnaire has a number of questions in section 2.

To participate in the public consultation you are not obliged to fill in all questions. The different sections include questions on greenhouse gas reductions, the impact of consumers, the economic activity, energy, forests and land use, education and research, financing, meta trends, actors and adaptation to climate change. The final section is technical and more focussed on sectoral stakeholders (industry, transport, agriculture, land use).

Some questions are multiple choice questions. Other questions are open to which you can add if you want your comments. Please keep comments clear and concise because there is a limit on the number of characters you can enter.

If you want to express your views in more detail you can also upload a document with your views and insights.

As the results will be published on the Internet, please read the specific privacy statement attached to this consultation. It informs you about how your personal data and contribution will be dealt with. In the interest of transparency, if you are replying on behalf of an organisation, please register with the register of interest representatives if you have not already done so. Registering commits you to complying with a Code of Conduct. If you do not wish to register, your contribution will be treated and published together with those received from individuals.

General information about respondents

* In what capacity are you completing this questionnaire?
  - ○ as an individual in your personal capacity
  - ◉ in your professional capacity or on behalf of an organisation

* Please give your name if replying as an individual/private person, otherwise give the name of your organisation:

Text of 3 to 100 characters will be accepted

European Technology and Innovation Platform for Smart Networks for the Energy Transition (ETIP SNET)

Email address:

info@etip-snet.eu

* For individuals, country of residence; for professionals, headquarters and main country of operations:

Belgium

* Type of organisation (please select the answer option that fits best):
  - ○ Private enterprise
  - ○ Professional consultancy, law firm, self-employed consultant
  - ○ Trade, business or professional association
  - ◉ Non-governmental organisation, platform or network
  - ○ Research and academia
  - ○ Social partners
  - ○ National, regional or local authority (mixed)
  - ○ Other

Please indicate the economic sector you are active in (as an individual or as an organisation)
  - ○ Agriculture, Hunting and Forestry
  - ○ Financial Intermediation
  - ○ Fishing
  - ○ Real Estate, Renting and Business Activities
  - ○ Mining and Quarrying
  - ○ Public Administration and Defence;
  - ○ Manufacturing
  - ○ Education

- (●) Electricity, Gas and Water Supply
- ( ) Health and Social Work
- ( ) Construction
- ( ) Other Community, Social and Personal Services
- ( ) Wholesale and Retail Trade:
- ( ) Activities of Private Households as Employers
- ( ) Hotels and Restaurants
- ( ) Extraterritorial Organisations and Bodies
- ( ) Transport, Storage and Communications
- ( ) Other

* If you are a civil society organisation or a public administration, please indicate your main area of focus or your area of competence:

Text of 3 to 100 characters will be accepted

European Technology and Innovation Platform for Smart Networks for the Energy Transition (ETIP SNET)

What size does you organisation have?

- ( ) Micro or small enterprise (10-49 persons employed)
- ( ) Medium-sized enterprise (50 - 249 persons employed)
- (●) Large enterprise (250 or more persons employed)

If your organisation is registered in the Transparency Register, please give your Register ID number:

20 character(s) maximum

If your organisation is not registered, you can register now.

* Please indicate your preference for the publication of your response on the Commission's website:

- (●) Under the name given: I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication
- ( ) Anonymously: I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication
- ( ) Not at all — please keep my contribution confidential (it will not be published, but will be used internally within the Commission)

(Please note that regardless the option chosen, your contribution may be subject to a request for access to documents under Regulation 1049/2001 on public access to European Parliament, Council and Commission documents. In this case the request will be assessed against the conditions set out in the Regulation and in accordance with applicable data protection rules.)

Questions

Long term greenhouse gas emissions reductions

To achieve its temperature objectives, the Paris Agreement also includes a long term ambition to achieve a balance between emissions and removals of greenhouse gases by human activities in the second half of this century. Given that addressing climate change is a global challenge requiring all parties of the Paris Agreement to act, what do you think the EU should contribute to achieve the Paris Agreement's objectives:

- ○ Reduce greenhouse gas emissions in the EU by 80% by 2050 compared to 1990 levels
- ◉ Reduce greenhouse gas emissions in the EU more, within the range of 80 to 95% by 2050 compared to 1990 levels
- ○ Achieve already a balance between emissions and removals in the EU by 2050

In your opinion, what are the biggest opportunities and challenges

1000 character(s) maximum

Opportunities:

- EU leadership w.r.t. the expanding low-carbon energy system markets (new products / new business models)
- Enhancement of EU competitiveness at all levels
- EU leadership w.r.t. the harmonization of interoperability, standardisation and certification processes for the integration of the overall energy system
- Attraction of the best researchers, engineers and managers
- Acquisition of ICT skills by all workers in the energy sector
- EU as a reference on R&D labs and test beds on low-carbon energy systems.
- Increased energy independence in Europe

Challenges:

- Increase the level of technology investment, including break-through integration technologies via intensified research and innovation.
- Foster local energy markets and their design implementation.
- Foster the circular economy to mitigate environmental impacts and maximise energy efficiency by minimising energy losses and anticipating possible raw material shortages such as ‘rare earths’.

Consumers

Next to the deployment of available and forthcoming technologies, when looking at the long term, consumer choices also have a key role in achieving the decarbonisation of our economy. Please fill in this section based on your habits if you are an individual or, if you are from an organisation, considering the organisation practice.

In your opinion, where do you expect the largest changes to happen in your daily life in order to meet the climate change challenge?

- ○ Housing
- ○ Mobility
- ○ Food
- ○ Consumer goods and services

Housing and offices

Energy consumption

To which extent would you support the following options that allow reducing the energy consumption and related CO_2 emissions in buildings?

Improving further the energy performance (insulation, triple glazing, etc.) of your building?

- ○ Yes, I already have done it
- ◉ Yes, as a priority
- ○ Yes, but not as a priority
- ○ No, I rent
- ○ No, too expensive
- ○ No, other reason
- ○ No opinion / I do not know

Installing heating and water boilers that run on renewables?

- ○ Yes, I already have done it
- ○ Yes, as a priority
- ◉ Yes, but not as a priority
- ○ No, I rent
- ○ No, too expensive
- ○ No, other reason
- ○ No opinion / I do not know

Installing heating and cooling equipment and use electric appliances with the best energy performance label?

- ○ Yes, I already have done it
- ◉ Yes, as a priority
- ○ Yes, but not as a priority
- ○ No, I rent
- ○ No, too expensive
- ○ No, other reason
- ○ No opinion / I do not know

Buying carbon free electricity or generating your own renewable electricity?

- ○ Yes, I already have done it
- ◉ Yes, as a priority
- ○ Yes, but not as a priority
- ○ No, I rent
- ○ No, too expensive
- ○ No, other reason
- ○ No opinion / I do not know

Having a smart meter and consuming electricity mostly when prices are low?

- ○ Yes, I already have done it
- ◉ Yes, as a priority
- ○ Yes, but not as a priority
- ○ No, for privacy concern

- ○ No, I do not want to change my consumption habits
- ○ No, other reason
- ○ No opinion / I do not know

Domestic waste

Do you sort your waste (paper, plastics, glass, metal, glass, organic…)?

- ○ Yes
- ○ No
- ○ I do not see the interest

What would make you increase the separation of waste (paper, plastics, glass, metal, glass, organic…)?

- ○ Adapted infrastructure (containers, etc.)
- ○ Awareness campaign
- ○ Financial incentives such as deposit schemes
- ○ Other

Do you think increased recycling and reuse are important to achieve greenhouse gas reductions?

- ◉ Yes
- ○ No
- ○ I do not know

Mobility

To which extent would you support the following options that allow reducing the energy consumption and related CO_2 emissions?

Buying a vehicle that does not run on petrol or diesel (for instance an electric car)?

- ◉ Yes
- ○ Yes, but only if not more expensive than conventional petrol or diesel cars
- ○ Yes, but only if sufficient refuelling infrastructure is available
- ○ No

Considering using car sharing services?

- ◉ Yes
- ○ Yes, but only if an easy to use and affordable service is in place
- ○ No

For short trips, avoiding private car and rather using public transport?

- ○ Yes
- ○ Yes but only if an accessible and regular service is in place
- ○ No, because they are too slow
- ○ No, because it is too expensive
- ○ No

For short trips, avoiding private car and rather using (electric) bike or other active mobility modes?

- Yes
- Yes, but only if proper bike lanes are in place
- No

For longer distance, avoiding flights or car whenever an alternative is available?

- Yes
- Yes, provided a convenient alternative is in place
- No, too slow
- No, too expensive
- No, other reason

Do you think better urban planning would reduce the use of private cars and reduce congestion in the urban areas?

- Yes
- Yes, if combined with better public transport
- Yes, but difficult to put in place
- No

Do you think using more IT tools such as tele-working or video-conferencing could reduce mobility needs?

- Yes
- Yes, to some extent
- No, as difficult to put in place
- No

Food

Food production, processing and delivery have an impact on greenhouse gas emissions and natural resources consumption.

Would you consider it important that further awareness raising is undertaken about the impact of various types of food consumption on climate?

- Yes
- No

Would you consider the impact of food on greenhouse gas emissions when buying it?

- Yes
- Yes, if information is available about the carbon intensity of food
- Not if more expensive
- No

Also taking into account the importance to have a balanced diet for health purposes, would you consider changing to a less carbon intensive food diet (e.g. reduce red meat consumption)?

- Yes
- No

- ○ I would require more information before changing my diet

Consumer goods and services

The products/services you consume and the way they are produced also impact energy consumption and related greenhouse gas emissions.

Do you ever consider the impact on greenhouse gas emissions when buying and consuming a product or services?

- ○ Yes I do so regularly
- ○ Yes but I often lack the information to do so
- ○ No, I don't consider this

Would you consider buying products and services from companies that produce their goods and services in a greenhouse gas neutral manner?

- ○ Yes
- ○ No, if more expensive
- ○ No, other
- ○ No opinion / I do not know

Your work and your economic sector

For both individuals and organisations, details on the economic sector should be provided in Section 1.

Employment and a socially fair transition

In the coming decades, the transition to a low carbon economy will impact even more how we work and how we produce goods and services. Which statements below correspond in your opinion to the impact of climate change and the low carbon transition in your working environment?

Do you expect your company to create or reduce jobs due to the low-carbon transition?

- ◉ Create
- ○ Reduce
- ○ No opinion / I do not know

What could affect your job most in the future?

- ○ The low carbon transition
- ○ Digitalisation
- ○ Impact of globalisation
- ○ Socio-economic policies (for instance fiscal policy)
- ◉ Other

* If other, please specify:

Text of 3 to 200 characters will be accepted

A combination of the low carbon transition and digitalization will impact jobs in the future. For instance, workers in the energy sector will need ICT skills to use and operate digital technologies

Do you think you or the sector you are active in would benefit from training of staff in the context of the energy and low carbon economy transformation?

- (●) Yes
- ( ) Yes, to some extent
- ( ) No
- ( ) No opinion / I do not know

The impact of the low carbon transition on your sector

Do you consider the low carbon transition as an opportunity or as a challenge for your sector?

- ( ) An opportunity
- ( ) A challenge
- (●) Both
- ( ) None
- ( ) No opinion / I do not know

Indicate by how much your sector could reduce greenhouse gas emissions by 2050 compared to today?

- ( ) It cannot reduce
- ( ) Up to half
- ( ) By more than half
- (●) Can decarbonise entirely
- ( ) No opinion / I do not know

What would be the preferred route to reduce these emissions in your sector?

- ( ) Further electrify
- ( ) Use other low carbon fuels, like hydrogen
- ( ) Improve to the maximum energy efficiency
- ( ) Circular economy, including recycling and re-use
- ( ) Development of new products and business concepts
- (●) Other
- ( ) No opinion / I do not know

* If other, please specify:

Text of 3 to 200 characters will be accepted

All of the above + RES as key factor – new storage technologies - digitalization of the energy network

Will you (or your sector) invest in new low-carbon technologies?

- (●) Yes, as a priority
- ( ) Yes, but not as a priority

- ○ No, it has already invested enough
- ○ No
- ○ No opinion / I do not know

Do you think your sector could be further integrated with others so as to decrease emissions while increasing overall efficiency?

- ◉ Yes
- ○ No
- ○ No opinion / I do not know

If your sector can be further integrated to others, please mention how and to which sector(s):

200 character(s) maximum

Energy sector already couples power grids (as energy system backbone) with gas & heat networks and with mobility. Integration with other sectors (agriculture and water) might be relevant in the long t

Do you think the low carbon transition will lead the EU economy to:

- ◉ Modernise and reinforce its competitiveness
- ○ Modernise, and reinforce its competitiveness, but only if non-EU countries and regions also engage in the transition towards a low carbon economy
- ○ Lose competitiveness
- ○ No opinion / I do not know

Do you think the low carbon transition can help the EU industry modernise and grow?

- ◉ Yes
- ○ Yes, but only with public support
- ○ Yes, but only if non-EU countries and regions also engage in the transition towards a low carbon economy
- ○ No
- ○ No opinion / I do not know

How can opportunities and challenges (in particular related to carbon intensive sectors or regions) be addressed? What key economic transformations should the EU pursue to achieve a low carbon and resilient economy?

1000 character(s) maximum

ETIP SNET promote a low-carbon, secure, reliable, resilient, accessible, cost-efficient & market-based pan-European integrated energy system supplying all society and paving way for fully carbon neutral circular economy by 2050, maintaining and extending global industrial lead in energy systems during energy transition.
The Vision:
•Efficient energy systems' organisation
Cooperation of system operators (elec./gas/heat)
Highly automated energy systems
Local optimisation in priority (subsidiarity)
•Markets enabling energy transition
Wholesale markets for cross-border exchanges of RES
Local markets enabling citizen involvement
•Digitisation enabling new services for integrated energy systems
•Infrastructure for integrated energy systems
Upgraded energy networks
Large-scale roll-out of conversion & storage technologies
Efficient energy supply & use (via cogeneration & waste heat recovery from industry to buildings)
Further electrification from efficient & RES sources

Energy

The energy system today is responsible for ca. 75% of the EU's greenhouse gases emissions and undergoes a rapid transition due to e.g. cost reduction of renewables, improvements of energy-efficiency and rapid development of new technologies (e.g. batteries) driven i.a. by policies put forward by the EU and its Member States. Accelerating this change will play a central role in the transition of our economy towards a carbon-neutral economy.

In the following table listing different energy technologies, please rank each option in the table below from 1 (important) to 5 (not important) on what role you think they will play in the clean energy transition (not all options need to be ranked)?

	1	2	3	4	5
Energy efficiency reducing the need to produce energy	◉	○	○	○	○
Renewable energy from wind, solar or hydro	◉	○	○	○	○
Other forms of renewable energy, like geothermal, wave or tidal	○	◉	○	○	○
Nuclear energy	○	○	○	◉	○
Fossil fuels with Carbon Capture and Sequestration	○	◉	○	○	○
Solid biomass for heat and electricity production	○	○	◉	○	○
Advanced Liquid Biofuels	○	○	◉	○	○
Biogas from agricultural and domestic waste	○	○	◉	○	○
Electricity storage (e.g. batteries)	◉	○	○	○	○

Hydrogen (produced in a carbon-neutral manner)	○	○	◉	○	○
E-fuels derived from hydrogen	○	○	◉	○	○
Other	◉	○	○	○	○

* If other, please specify:

Text of 3 to 200 characters will be accepted

Energy networks, all forms of conversion (power to heat or gas, gas or heat to power…) and all forms and sizes of network-connected storage (e.g: batteries, hydro storage, gas storage, heat storage…)

What are the biggest opportunities, including for the wider economy? What are the biggest challenges, including as regards public acceptance or the availability of land and natural resources, related to these future developments?

2000 character(s) maximum

The implementation of the energy transition will be market-based: the investments in energy system technologies will be catalysts for innovation & spill-over into other economic and technological sectors, thus contributing to the growth of the European economy. Implementing ETIP SNET Vision 2050 requires major investments for the large-scale development & deployment of efficient conversion from all energy carriers to all energy carriers and storage devices, the upgrade & extension of the pan-European transmission (electricity and gas) & local distribution (electricity, gas, heating and cooling) energy networks & the use of digital solutions.
Challenges:
•Public acceptance, e.g. with regards to power grid reinforcement & new generation plants including renewables; use of the most efficient technologies, overhead lines might be replaced by more expensive & challenging technological options (underground DC cables)
•Need to anticipate possible raw material shortages such as 'rare earths'
•Availability of land for renewable energy generation should be subject to assessment (e.g. avoid using land suitable for food production)
•Maximise the efficient use of available natural resources (e.g. use biomass/biogas efficiently, install wind & solar plants with richest wind and solar potential)
For a cost-effective decarbonisation, taking an integrated approach to energy systems will ensure synergies are unlocked between electricity, gas & heat networks, across sectors and at different levels (local, national and EU). Decarbonisation solutions should apply energy efficiency first, be diversified & optimised across all energy systems, and consider all costs (e.g. power grid reinforcements, short term, mid-term and seasonal storage). Conversion technologies that can provide flexibility and efficiency between energy systems should be supported, also for their broader system benefits (energy savings, reduced costs, avoid grid reinforcement, environmental benefits)

The role of Forests and Land Use

Today, EU's forests, agriculture and land absorb more CO_2 than they emit, which is referred to as the EU's sink. Forests and agriculture land produce renewable biomass that can be used to substitute other carbon intensive products or to produce bioenergy, which in turn reduce greenhouse gas emissions from

fossil fuels and industrial processes. Depending on how this biomass is produced, this can impact the size of the EU's sink, as well impact other services delivered by agriculture and forest land including biodiversity and ecosystem services.

In the context of a long term strategy please rank each land-use activities in the table below from 1 (important) to 5 (not important) to indicate which are acceptable and can be important to reduce greenhouse gas emissions and increase CO_2 absorptions (not all options need to be ranked):

	1	2	3	4	5
Forest as a source for biomass for renewable energy	○	○	○	○	◉
Forest as a source of material for bio-based products	○	○	○	◉	○
Forest as a carbon sink storing CO_2	◉	○	○	○	○
Agriculture as a source of feedstock for bio-based materials	◉	○	○	○	○
Agriculture as a source for bio-energy	◉	○	○	○	○
based on food crops	○	○	○	○	◉
based on agricultural wastes	◉	○	○	○	○
based on woody biomass (e.g. perennials, woody and herbaceous crops, short rotation coppice)	○	○	◉	○	○
Protecting and enhancing soil carbon stocks on agricultural land	○	○	○	○	○

What should be the role of the land-use sector in reducing emissions and increasing absorptions emissions? For what purposes should biomass be used most to reduce greenhouse gas emissions? How and which sustainability concerns should be addressed?

1000 character(s) maximum

Biomass utilisation should be incentivised and accounted for GHG reduction if and only if there is undisputed evidence that lack of doing so would lead to higher CO2 in atmosphere.

Education, research and innovation

Considering the long time frame of the strategy, and the inherent magnitude of the decarbonisation transition, the central role of accelerating research and innovation for facilitating this transition will be crucial.

How best could awareness be raised to create the right attitude and values/ mind-sets?

at most 3 choice(s)

- [x] At school through education
- [x] Local and regional campaigning
- [x] National and EU wide campaigning

On which sectors should R&D efforts focus primarily in the coming decade to best support the low carbon transition?

at most 6 choice(s)

- [x] Energy
- [x] Industrial processes
- [x] Transport
- [x] IT
- [ ] Agriculture
- [x] Other field

* If other, please specify:

Text of 3 to 200 characters will be accepted

R&D should address integration of energy, industrial processes, transport and IT

On which cross-sectoral domains should R&D efforts focus in the coming decades? Is there a particular need for large scale deployment of certain innovative technologies? Is there a different role for authorities and private sector in support R&D and Innovation?

1000 character(s) maximum

Europe must have the world's leading R&D infrastructures covering the entire energy system. Innovative research must be validated in large-scale demonstrations to manage risks and to test the integration in energy network operation of new electricity production, consumption and other developments, as well as cross-sectoral concepts, energy conversion and storage technologies and digitalisation.
The risk spectrum associated with massive investments in long-term technological RD&I can lead to market uptake failures or the non-optimal use of resources. Innovation needs funding which cannot be obtained only from financial markets. Therefore, public sector incentive support is essential, both at European and national /regional levels, as well as the private sector's investment in R&D. Publicly-funded RD&I activities must focus on high-risk innovations.
EU mechanisms to foster venture capital and sustainable finance are needed to support entrepreneurship with startup funding rounds.

Financing

In many cases, the low carbon economy and energy transition needs high upfront investments with subsequent reductions in operating and fuel costs. In addition, this transition as well as climate change itself will most likely affect the value of existing investments and assets of companies. Finally, to achieve the transition efficiently, the viability and profitability of investments need to be ensured on the long-term. Most of these investments will have to be funded via private finance.

Will the sector that you are active in require significant additional investment in the context of a transition to a low carbon economy?

- (●) Yes
- ( ) No
- ( ) No opinion / I do not know

For the sector that you are active in, is there a financing gap for making the transition to a low carbon economy?

- (●) Yes
- ( ) No
- ( ) No opinion / I do not know

Should public sector be more involved in ensuring adequate financing for the low carbon transition?

- ( ) Yes, through direct investment
- (●) Yes, through measures ensuring more low cost finance for sustainable investments
- ( ) No because of the risk of prompting inefficient investment leading to stranded assets
- ( ) No because of crowding effects on other sectors
- ( ) No opinion / I do not know

Would you consider that, in your sector, companies are sufficiently transparent about the financial risks they face due to climate change and the low carbon economy and energy transition?

- ( ) Yes
- (●) No
- ( ) No opinion / I do not know

Meta trends

Do you think the following trends are important to reduce greenhouse gas emissions.

Economic transition towards a more circular economy?

- (●) Positive
- ( ) Negative
- ( ) Neutral

Digitalisation, including robotisation and artificial intelligence?

- (●) Positive
- ( ) Negative
- ( ) Neutral

Shared economy?

- (●) Positive
- ( ) Negative
- ( ) Neutral

Further interdependency of sectors across borders through globalisation?

- ○ Positive
- ○ Negative
- ◉ Neutral

Actors

Local authorities such as cities and local communities, as well as other actors such as civil society and the private sector, can play an important role in achieving the energy transformation, reducing greenhouse gas emissions and adapting to climate change. Indeed thousands of cities, companies and citizens' organisations are implementing the low carbon economy and energy transition through projects covering energy, transport, food and waste management, often achieving important local co-benefits related to economic development, health and wellbeing.

Which of these non-state actors do you think will impact most your or your sector's contribution to delivering the EU's ambition to become a low carbon economy?

- ○ Regional government
- ◉ Towns and cities
- ○ Businesses
- ○ Philanthropies
- ○ Civil society (NGOs, ..)
- ○ Religious groups

Do you have an example that you think is of particular importance to underline the role of such local and private sector actors in supporting the low carbon economy and energy transition?

1000 character(s) maximum

The subsidiarity principle should be applied to European energy system. Actions that cannot be handled locally are handled at the next level. Monitoring and control of generation, conversion, storage and consumption in all energy sectors should be done within regions which are dynamically sized and cell-based. Peer-to-peer transactions integrated with centrally and locally controlled electricity networks, supported by automated local grids together with network operator actions, will be key to ensure the resilience of the EU energy system. Local retail markets should ensure high-quality, efficient operations with high security of supply. Energy distribution supplying citizens located in geographical areas with locally available renewable energy sources should be handled in tandem with local storage and conversion devices from and to local gas and heat networks. Companies evolving to energy services providers will play also a relevant role.

Adaptation

The adverse effects of climate change will increase in the coming decades unless strong mitigation policies are implemented globally. In your place of living, which of the following actions do you think will be necessary to prepare for the likely effects of climate change? Please rank each option in the table below from 1 (important) to 5 (not important) to indicate which, in your place of living, you think will be necessary to prepare for the likely effects of climate change (not all options need to be ranked).

	1	2	3	4	5

Scientific research on the local effects of climate change in the place where you live					
Reinforcement of infrastructure (transport, energy, communication networks) to withstand natural disasters					
Preparation for floods (water retention, dykes, designated flood plains /areas, restriction of activities in areas at flood risks, floating houses etc.)					
Adaptation of agriculture to the changing climate (e.g. water efficient irrigation, selecting different crops)					
Heat wave action plans					
Increase of green areas in towns to cope with heatwaves / floods					
Encouragement of water saving and reuse					
Forest fire prevention (e.g. awareness raising campaigns, forest management…)					
Reinforcement and protection of the seacoast					
Early warning systems for natural disasters (heatwaves, floods, forest fires…)					
Communication to the public about the need to adapt to climate change					
Improved insurance products against damage from the effects of climate change					
Better understanding of the security effects of climate change on the EU (e.g. flows of migrants, global water and food scarcity, agricultural trade)					

Which adaptation measures are of particular importance for your sector and why?

1000 character(s) maximum

ETIP SNET cover all places of living in Europe, therefore all the above measures are important. The approach to security of supply needs to consider all energy systems with a focus on resilient operation, efficient control and optimal redundancy, to support systems' operational reliability in cases of disturbances or deviations from planned energy consumption and energy-infeed into the various networks. Security of supply is also linked to the delivery of energy through different types of energy networks which enable the overall system to be more secure, reliable and resilient. A resilient system must be able to adapt dynamically to ride through any individual or multiple contingency and to operate in a partly isolated, degraded mode to safeguard essential energy services in case of extreme climate conditions. In addition, locally available energy resources must be used to their full economic potential, helping maximise the resilience of supply channels for heating and cooling needs.

Specific sectoral questions

These questions are focused on sector specific greenhouse gas reduction options, and as such are primarily directed to sectoral stakeholders.

Reducing industrial greenhouse emissions

Industry has a diverse set of greenhouse gas emissions sources, the majority are linked to energy consumption but also a significant amount of emissions comes from chemical processes, for instance in the steel, cement and chemical sectors.

Industry has a number of mitigation options to reduce its greenhouse gas emissions. These typically involve improved efficiency (e.g. using more efficient products and technologies, reusing waste heat, etc.) and fuel substitution (e.g. electrification of its processes). But it also includes feedstock substitution, be it with bio-material or by employing Carbon Capture and Utilisation (CCU) technologies that see CO_2 emissions being re-used in other production processes. These technologies also often benefit from further integration of energy and industrial sectors.

Please indicate for which sector you see any of the above or other mitigation options of particular importance. Please indicate what your view is in terms of mitigation potential, economic potential and technology readiness. Assess each option as High, Medium, Low or Zero for each criterion and indicate in which year you think the technology would be ready for large scale deployment.

	Industrial Sector	Technology option	Mitigation potential	Economic viability	Technology readiness	Year of large scale deployment
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Transport has a number of options to reduce its greenhouse gas emissions. While low- or zero-emission technologies are already successfully deployed for parts of the transport sector (e.g. cars and vans), the technological development is in earlier stages of development or deployment for other parts of the transport sector (e.g. long-haul trucks, aviation or maritime).

Please indicate for which part of the transport sector you see particular mitigation options and their importance. Please indicate what your view is in terms of mitigation potential, economic potential and technology readiness. Assess each option as High, Medium, Low or Zero for each criterion and indicate in which year you think the technology would be ready for large scale deployment.

	Transport Sector	Technology option	Mitigation potential	Economic viability	Technology readiness	Year of large scale deployment
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

In addition, would you please indicate your choice for the following options that allow reducing the energy consumption and related CO_2 emissions?

For freight transport, would you consider switching from road to alternative modes like rail, waterways or coastal shipping?

- Yes
- No, too slow or complicated
- No, too expensive
- No opinion / I do not know

For first/last mile logistics in urban areas, would you consider switching from road to alternative modes like (electric) cargo bike or similar zero-emission vehicle?

- Yes, I am already doing it
- Yes, in the future
- No, too slow
- No
- No opinion / I don’t know

Reducing greenhouse emissions from agriculture

Several options exist to reduce greenhouse gas emissions in agriculture even though the mitigation potential of the agricultural sector, notably related to the sector's non-CO_2 emissions, is seen as more limited than for other sectors. Furthermore, agriculture is a sector that through its impact on land use also will affect how our natural sink, and thus the related CO_2 absorptions, will evolve.

Please indicate which mitigation options are of particular importance. Assess each option as High, Medium, Low or Zero for each criterion and indicate in which year you think the technology would be ready for large scale deployment.

	Agriculture sector	Technology option	Mitigation potential	Economic viability	Technology readiness	Year of large scale deployment
1						
2						
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Role of CO_2 removal

The objectives of the Paris Agreement are challenging and many scientists consider that it will be necessary at a certain point to remove a significant amount of CO_2 from the atmosphere in order to stay below 2°C and certainly in case the temperature increase should be limited to 1.5°C. There are a limited number of options to remove CO_2 from the atmosphere.

The removal of CO_2 can be accomplished by 1) capturing CO_2 via natural photosynthesis or artificial chemical processes, and then 2) storing CO_2 in long term geological sites or within biomass and (bio) materials.

Rank from 1 (important) to 5 (not important) on what role you think this removal and storage options can have in the EU to deliver negative emissions taking into account issues such as economic and technical feasibility, storage potential, environmental integrity and social acceptance.

Capture of CO_2 from the atmosphere

	1	2	3	4	5
Intensive afforestation	○	○	○	○	○
Forest and cropland residues	○	○	○	○	○
Woody perennial plantations	○	○	○	○	○
Direct Air Capture	○	○	○	○	○
Other	○	○	○	○	○

Storage of CO_2

	1	2	3	4	5
Carbon capture and storage (CCS) with enhanced oil or gas recovery	○	○	○	○	○
CCS in onshore geological sites	○	○	○	○	○
CCS in offshore geological sites	○	○	○	○	○
Carbon Capture and Utilisation (CCU) (long lived products)	○	○	○	○	○
Increased permanent carbon stock in soils	○	○	○	○	○
Increased permanent carbon stock in plants	○	○	○	○	○
Other	○	○	○	○	○

What main barriers do you see currently preventing the large scale deployment of CCS, including on how to use it to generate negative emissions? What are the particular challenges related to biomass CCS? What type of CCU (Carbon Capture and Utilization) would lend itself to create long term storage? Are there other technologies that should also be considered? What policies do you think the EU should pursue to better help development and deployment?

1000 character(s) maximum

Additional Comments

If you wish to add further information, comments or suggestions - within the scope of this questionnaire - please feel free to do so here:

1000 character(s) maximum

The document “ETIP SNET VISION 2050 – Integrating Smart Networks for the Energy Transition: Serving Society and Protecting the Environment” is attached to this questionnaire. It promotes a low-carbon, secure, reliable, resilient, accessible, cost-efficient, and market-based pan-European integrated energy system supplying all of society and paving the way for a fully carbon-neutral circular economy by the year 2050, while maintaining and extending global industrial leadership in energy systems during the energy transition.

In addition, you could also upload a document proving further information, comments or suggestions:

The maximum file size is 1 MB

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