Position Paper

Brussels, 9 October 2018

STRATEGY ON LONG-TERM EU GREENHOUSE GAS (GHG) EMISSIONS REDUCTION:

TURNING CHALLENGES INTO OPPORTUNITIES - THE CONTRIBUTION OF THE EUROPEAN TECHNOLOGY INDUSTRIES

The European Technology Industries represented by Orgalime support the development of a Strategy for long-term EU Greenhouse Gas Emissions Reduction in accordance with the Paris Agreement, taking into account Member States' national plans. It is essential to prepare ourselves on time for a profound transformation of the entire global economy and society and tapping the undisputed, multiple opportunities that such a transformation holds for all of us.

It also means managing the challenges arising from it in a fair, inclusive, responsible, socially acceptable and overall sustainable manner. Not acting, however, is no longer an option:

- climate change affects every country and citizen.
- the global landscape is undergoing a fundamental, rapid and irreversible change primarily due to decarbonisation, digitisation and decentralisation ("the 3D change"), and
- the negative economic, environmental and social impacts of delayed action or no action will be higher than those of immediate actions[1].

Orgalime industries offer a vast variety of different clean tech solutions for reducing GHG emissions in Europe and globally and are continuously improving the environmental performance of their own industrial processes and products. Through the Ecodesign and Energy Labelling Directives, the industry contributes to the realisation of almost half of the EU's 2020 energy efficiency target. As the European Technology Industries we are committed to further investing in the development of clean tech.

The Paris implementation process however needs to provide a true EU and global market perspective for Orgalime industries to remain in a position to keep the high investment of our industries in this area. While targets provide important market signals, choosing the right instruments and setting the proper innovation and investment conditions will drive real change. In this paper, we outline a number of instruments and framework conditions that we consider essential for driving a successful implementation of the Paris Agreement, and we set out the rationale why the European Technology Industries believe that these are able to turn the current challenges into opportunities, thereby fuelling prosperity and welfare in Europe, for its citizens, environment and industry alike.

[1] IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways

Orgalime representing the European Technology Industries speaks for 45 trade federations of the mechanical, electrical, electronic, metalworking & metal technology industries of 23 European countries. The industry employs nearly 11 million people in the EU and in 2017 accounted for some €2,000 billion of output. The industry represents over a quarter of the output of manufactured products and over a third of the manufactured exports of the European Union.

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1. INTRODUCTION

In 2011, the European Commission published its Communication "A Roadmap for moving to a competitive low carbon economy in 2050" and its Energy Roadmap 2050 [COM/2011/885]. Both of these documents drew important conclusions and recommendations at that time, as Orgalime commented in its 2011 position paper.

Many of the conclusions and recommendations of these 2011 reference documents in our view remain generally valid (see chapter 2 of this paper) and have already led to important EU action, including the Clean Energy and Climate Packages, which we widely support.

However, several important developments took place since, which render an update of the 2011 Roadmaps and presentation of a holistic EU Strategy for long term EU Greenhouse Gas Emissions Reduction necessary. These include in particular the following:

- The *ratification and entry into force of the Paris Agreement* to keep global temperature increase to well below 2°C and to pursue efforts to limit increase to 1.5°C above pre-industrial levels.
- The adoption and entry into force of the *17 UN Sustainable Development Goals (UN-SDGs) of the 2030 Agenda for Sustainable Development*, including SDG13 on Climate Change, SDG 7 on Affordable, Clean Energy. The implementation of the Paris Agreement is essential for achieving the UN SDGs and provides a roadmap for climate actions to reduce emissions and build climate resilience.
- The *adoption of the EU Energy Union Strategy and finalisation of key files of the Clean Energy and Climate Packages*, notably the new EU Governance Regulation, the revised Energy Performance of Buildings Directive 2018/844 Directive and the revised EU Emission Trading Directive 2018/410 and Effort Sharing Decision. An increased energy efficiency target from 30% to 32.5% by 2030 and an increased renewables target from 27% to 30% by 2030 are equally on their way.
- The *commitments of governments around the globe* to boost clean building technologies and e-mobility, with California leading investments in the building sector and China having become the global leader in electric vehicles investments.
- The *(more) rapid (than expected) cost decrease of renewable energy and storage technologies* and the increasing digitisation of the economy, the industry, energy, transport and buildings sectors.
- The *increasing decentralisation and digitisation of the energy system* turning consumers into active customers, businesses and energy communities that self-generate, self- consume, store and trade energy from renewable energy sources.
- The increasing trend of *integrating key energy end-use sectors with the power sector ("sector coupling")* in support of a coordinated and comprehensive energy and low carbon transition.

Building upon the 2011 work and considering the above mentioned new developments, ORGALIME therefore recommends:

- **Accelerating action at all levels** and considering **the next decade as critical**,
- Building **strong acceptance with all stakeholders**, and
- **Coordinating** the new national long-term GHG reduction strategies, roadmaps and energy & climate plans.

2. TAKE AWAYS FROM THE 2011 LOW CARBON AND ENERGY 2050 ROADMAPS

Orgalime considers many of the points raised in the 2011 Low Carbon and Energy 2050 Roadmaps as still fully valid. In particular the following points raised in these Roadmaps should be taken into account in the long-term EU GHG Reduction Strategy to come:

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- To keep climate change below 2ºC, the **European Council reconfirmed in February 2011 the EU objective of reducing greenhouse gas emissions by 80-95% by 2050 compared to 1990**,
- As well as reducing the threat of dangerous climate change as part of ambitious global action, deep reductions in the EU's emissions have the potential to **deliver benefits in the form of savings on fossil fuel imports and improvements in air quality and public health.**
- Investing early in the low carbon economy would stimulate a gradual structural change in the economy and can create in net terms **new jobs both in the short- and the medium-term.**
- In the longer-term, the creation and preservation of jobs will depend on the **EU's ability to lead in terms of the development of new low carbon technologies** through increased education, training, programs to foster acceptability of new technologies, R&D and entrepreneurship, as well as favourable economic framework conditions for investments.
- Analysis of different scenarios has shown that domestic **emission reductions of the order of 40% and 60% below 1990 levels would be the cost-effective pathway by 2030 and 2040** respectively and as illustrated all sectors would have to contribute:

Figure 1: EU GHG emissions towards an 80% domestic reduction (100% =1990)

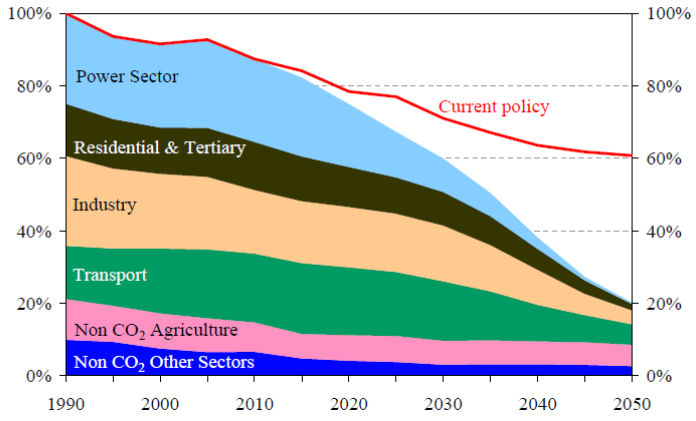

Table 1: Sectoral reductions

GHG reductions compared to 1990	2005	2030	2050
Total	-7%	-40 to -44%	-79 to -82%
Sectors			
Power (CO_2)	-7%	-54 to -68%	-93 to -99%
Industry (CO_2)	-20%	-34 to -40%	-83 to -87%
Transport (incl. CO2 aviation, excl. maritime)	+30%	+20 to -9%	-54 to -67%
Residential and services (CO_2)	-12%	-37 to -53%	-88 to-91%
Agriculture (non-CO_2)	-20%	-36 to -37%	-42 to -49%
Other non-CO_2 emissions	-30%	-72 to -73%	-70 to -78%

- **Full deployment of energy efficiency** was considered as **fundamental:** the energy system and society as a whole need to be dramatically more energy efficient. **The co-benefits of achieving energy efficiency in a wider resource efficiency agenda should contribute to meeting the goals in a faster and cost-efficient manner**.
- **The built environment** provides low-cost and short-term opportunities to reduce emissions, first and foremost through improvement of the energy performance of buildings.
  The Commission's analysis has shown that **emissions in this area could be reduced by around 90% by 2050**, a larger than average contribution over the long-term. **Shifting energy consumption towards low carbon electricity** (including heat pumps and storage heaters) **and renewable energy** (e.g. solar heating, biogas, biomass) would help to protect consumers against rising fossil fuel prices and bring significant health benefits.
- In transport, the synergies with other sustainability objectives such as the reduction of oil dependence, the competitiveness of Europe's automotive industry as well as health benefits,

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especially improved air quality in cities, make a compelling case for the EU to step up its efforts **to accelerate the development and early deployment of electrification.**

- In industrial sectors, the application of **more advanced resource and energy efficient industrial processes and equipment, increased recycling, as well as abatement technologies for non-CO2 emissions** could make a major contribution. As solutions**, sector-specific roadmaps should be developed in cooperation with the sectors concerned.**
- Unlocking the investment potential of the private sector and individual consumers presents a major challenge. While most of this extra investment would be paid back over time through lower energy bills and increased productivity, **markets tend to discount future benefits**, and disregard long-term risks. A key question is, therefore, how policy can create the framework conditions for such investments to happen, including through new financing models. **Public finance through innovative financing instruments**, such as revolving funds, preferential interest rates, guarantee schemes, risk-sharing facilities and blending mechanisms can mobilise and steer the required private finance, including for SMEs and consumers.
- The EU with little more than 10% of global emissions will not be able to tackle climate change on its own. **Progress internationally** is the only way to solve the problem of climate change, and the EU must continue to engage its partners.

More specifically for Electricity, the 2011 Roadmaps state the following:

- The **share of low carbon technologies in the electricity mix should reach nearly 100% in 2050.**
- **Electricity will have to play a much greater role** than now (almost doubling its share in final energy demand to 36-39% in 2050) and will have to contribute to the decarbonisation of transport and heating/cooling. Electricity could provide around 65% of energy demand by passenger cars and light duty vehicles, as shown in all decarbonisation scenarios. Final electricity demand increases even in the High energy efficiency scenario. To achieve this, the **power generation system would have to undergo structural change** and achieve a significant level of decarbonisation already in 2030 (57-65% in 2030 **and 96-99% in 2050**). This highlights the importance of starting the transition now and providing the signals necessary to minimise investments in carbon intensive assets in the next two decades.
- Given that the central role of electricity in the low carbon economy requires significant use of renewables, many of which have variable output, **considerable investments in networks are required to ensure continuity of supply at all times. Investment in smart grids** is a key enabler for a low carbon electricity system, notably facilitating **demand-side efficiency, larger shares of renewables and distributed generation and enabling electrification of transport.**

3. THE DEVELOPMENTS SINCE 2011

3.1 The Paris Agreement dynamic

Following the Paris agreement, and in line with keeping temperature rises to "well below 2°C and pursuing efforts to limit the temperature increase to 1.5°C", the EU committed to a 40% GHG reduction target by 2030 compared to 1990.

In 2015, the EU was responsible for some 10% of the world's total GHG emissions.[2] The EU is one of the major economies with the lowest per capita emissions. The EU is on track to meet the 20% target for 2020:

- EU emissions were reduced by 23% between 1990 and 2016, while the economy grew by 53% over the same period - this demonstrates that emission reduction and economic growth are fully compatible.

[2] Commission Roadmap for moving to a competitive low carbon economy in 2050, COM (2011) 112 final of 8.3.2011

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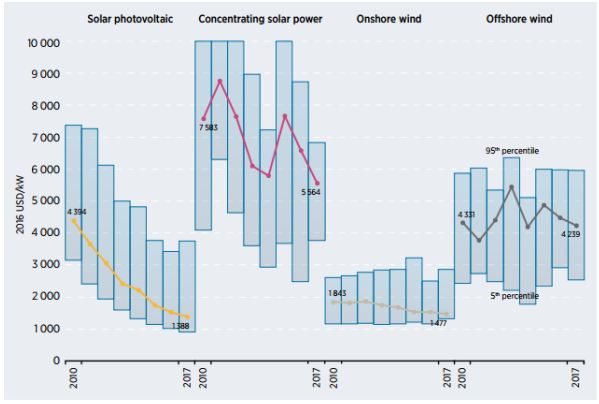
- EU emissions decreased by 0.7% in 2016, while GDP grew by 1.9%, however the pace of reduction should be significantly accelerated to reach the 2030 target.
- The EU continues to be actively involved in international climate policy and increased its climate finance contributions to reach €20.2 billion in 2016.[3]

Considering the outcome of negotiations on the Clean Energy Package, and the increased targets for energy efficiency and energy from renewable energy sources to 32.5% and 30% respectively, Europe's GHG reduction is expected to reach a 45% GHG reduction in 2030 rather than the current 40% target. Any target, however, requires the right instruments and proper innovation and investment conditions to eventually move forward. The Paris implementation process needs to provide a true EU and global market perspective for Orgalime industries to remain in a position to keep the high investment of our industries in clean technology development.

3.2 Costs of renewables and storage technologies have decreased rapidly

Over the period, costs for renewables and specifically renewable electricity generation went down very significantly. In its 2018 report on Electricity Generation Costs, the International Renewable Energy Agency (IRENA) mentions the following:
"Decreasing electricity costs from renewables and the low costs from the best solar PV and onshore wind projects, represent a real paradigm shift in the competitiveness of different power generation options. Solar and wind power will provide very affordable electricity, with all the associated economic benefits. Furthermore, their low costs mean that previously uneconomic strategies in the power sector can become profitable. "

Figure ES.4 Global weighted average total installed costs and project percentile ranges for CSP, solar PV, onshore and offshore wind, 2010-2017

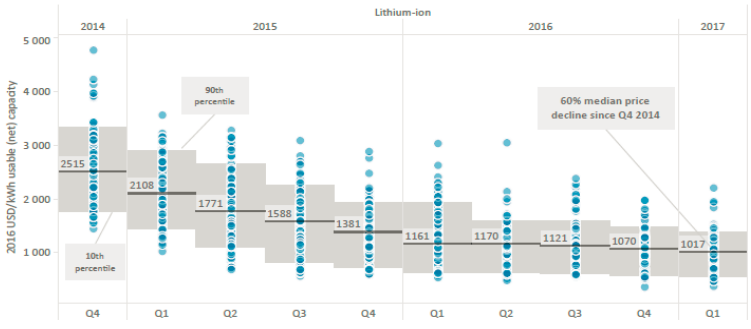


Source: IRENA Renewable Cost Database.

Source: https://www.irena.org/publications/2018/Jan/Renewable-power-generation-costs-in-2017

Storage costs have decreased similarly:

Figure 29: Home storage lithium-ion system offers in Germany from Q4 2014 to Q1 2017



Source: International Renewable Energy Agency, based on EuPD Research, 2017.

http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Oct/IRENA_Electricity_Storage_Costs_2017.pdf

[3] Commission report to the EP and Council "Two years after Paris – Progress towards meeting the EU's climate commitments", COM (2017) 646 final of 7.11.2017

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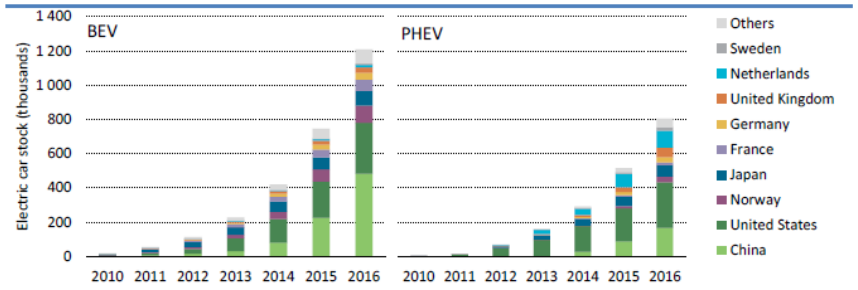
3.3 Policies for the development of sustainable mobility

- **E-mobility**

The 2017 Global EV Outlook of the International Energy Agency (IEA) provides the following information: From a few thousand vehicles a year in 2011, electric vehicle (EV) sales passed the bar of one million a year in 2015. Exponential growth is taking place and more and more governments and cities are putting targets to phase out fossil fuels engines with pollution limits.

Figure 8 • Evolution of the global electric car stock, 2010-16



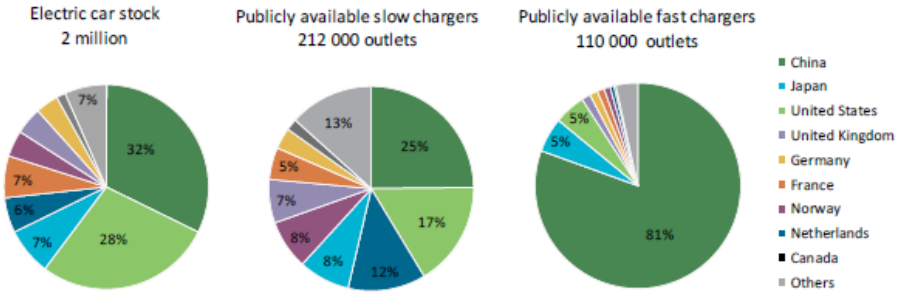
Notes: The electric car stock shown here is primarily estimated on the basis of cumulative sales since 2005. When available, stock numbers from official national statistics have been used, provided good consistency with sales evolutions.

Sources: IEA analysis based on EVI country submissions, complemented by EAFO (2017a), IHS Polk (2016), MarkLines (2017), ACEA (2017a, 2017b) and EEA (2017).

Key point: The electric car stock has been growing since 2010 and surpassed the 2-million-vehicle threshold in 2016. So far, BEV uptake has been consistently ahead of PHEV uptake.

The availability of charging stations is a key driver (or barrier) to EV development, and the development of publicly available charging stations is an issue to be dealt with in policy and regulation:

Figure 12 • Electric car stock and publicly available EVSE outlets, by country and type of charger, 2016



Sources: IEA analysis based on EVI country submissions, complemented by EAFO (2017a).

Key point: Electric cars still outnumber public charging stations by more than six to one, indicating that most drivers rely primarily on private charging stations. Publicly available EVSE shares are not evenly distributed across markets. This is consistent with the early stage of electric car deployment.

Several **additional policies to encourage EV developments** are being put in place, such as:

- CO2/km-based and zero-emission range-based purchase subsidy schemes
- Tax and financial incentives when replacing old diesel and petrol cars with clean alternatives
- Fuel duty exemption, vehicle excise duty exemption for BEVs
- Exemptions from congestion charging and road toll, free parking and bus lane access

With the number of EV increasing, recharging practices need to be managed and could even contribute to flexibility, demand response schemes and the better integration of intermittent renewable power generation. Policy may have to tackle the issue.
More details on EV issues are available here:
https://www.iea.org/publications/freepublications/publication/GlobalEVOutlook2017.pdf

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- **Intelligent Mobility and Logistics**

New, digitally enabled solutions for organising mobility (e.g. intelligent logistics and supply chain management, mobility platforms) can make a substantial contribution to avoiding GHGs by optimising transport operations.

- **Power-to-X technologies for sector integration**

While for light-duty vehicles direct electrification is generally the most efficient way to reduce greenhouse gas emission, there are certain applications like deep sea shipping, aviation or even long-distance transport on-road where today's technologies of storing the required amount of electrical energy are limited. These applications require gaseous or liquid energy carriers with a high energy density. In addition, setting up a full infrastructure and value chains for direct electrification is costly and slow.

We recommend fostering a stronger technological and political linkage between the energy and transport (including non-road) sectors as well as the maritime industry to help reaching the climate targets of the Paris Agreement.

Carbon-neutral technology options for a wide range of energy needs of businesses and citizens should be ensured, and solutions of energy storage and usage based on power-to-x technologies, such as power-to-liquid and power-to-gas, should be developed. The so-called e-fuels can be used to power established and proven technologies, such as internal combustion engines and turbines or even emerging technologies, such as fuel cells. As e-fuels could also be used in the existing fleet as an admixture to existing market fuels, they would have an immediate effect on the reduction of GHG-emissions and accelerate the energy transition. This will contribute to strengthening European industrial value chains and keeping jobs in Europe.

3.4 Sector Coupling: Integrating energy end-use sectors with the power sector

Sector coupling is the key challenge when it comes to a coordinated and comprehensive energy transition. It refers to interconnecting the main energy end-use sectors – buildings (heating and cooling), industry and transport – with the power sector. The aim is to achieve the politically defined energy and climate goals in all areas of business and society while also ensuring security of supply and affordability as a triad of energy policy objectives.

The networking of the energy, industry, buildings and transport sectors (i.e. the three markets of electricity, heating and transport) through sector coupling is multidirectional and has four distinguishing features that should all be taken into account:

- Physical: The availability of the technologies and the required amounts of energy
- Market-based: The energy markets must be linked in an open and equitable way
- Data-related: Only the availability of information on supply and demand in all sectors enables the energy systems to be linked in a sensible way
- Regulatory: Regulatory instruments must take reciprocal effects and permeability as well as economic aspects into account

3.5 Digitisation deployment

Digital technologies are developing at very high speed in sensors, communication, big data, artificial intelligence, IoT etc., and all these developments impact the energy system and the EU economy as a whole.

As to the energy sector, several applications and pilots are under deployment at all levels, in generation plants, in distribution grids and at end use and smart energy systems; and they are progressively becoming realities.

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Digital technologies help to manage the increased complexity of this system,

- through more automation and control to better manage processes,
- through more use of software and data analytics ("big data") to increase overall efficiencies and system stability, or
- at the energy retail level through empowering consumers so that they can be efficient, manage their own energy consumption and optimise their overall carbon and environmental performance. With the proper electricity market design in place, consumers would then be rewarded for the flexibility that they provide to the energy system and have the right and tools to self-produce and self-consume, to store, trade, sell, aggregate (including at district level) and participate in demand-response programs.

"Digitalised energy systems in the future may be able to identify who needs energy and deliver it at the right time, in the right place and at the lowest cost", as the International Energy Agency (IEA) mentions in its 2017 publication "Digitalization and Energy". Digitisation will thus be a key enabler of the energy system transition in allowing new services and in decreasing costs.

Digitally enabled technologies are also a key enabler of higher productivity and cost decrease of industrial processes, while simultaneously increasing energy and other resource efficiencies. Machine-Learning (artificial intelligence) will be one of the driving forces behind the technological change. Technologies, such as pattern recognition, machine vision, data analytics and algorithms for predictive maintenance have already successfully been applied in industrial applications. It is expected that digital technologies, such as machine learning or the intelligent use of industrial data, will contribute to further gains in competitiveness, for example by applying "human-like machine vision" for quality inspections or optimising the efficiency of complex production processes through adaptive, predictive control systems.

As regards transport, intelligent transport systems, intelligent logistics and supply chain management and mobility platforms are using digitally enabled technologies in all transport modes to increase efficiency, reliability and safety.

The long-term EU GHG emission reduction strategy therefore needs to tap into the potential of digitally enabled technologies throughout the different sectors for contributing to the realisation of the EU's emission reduction goals.

3.6 Decentralisation of energy resources and active role of energy consumers

Already today 90% of power generation from renewable energy sources is connected to the electrical distribution grid.[4] The agreed increase of the 2030 target from 27% to 30% of renewable energy is expected to lead to more than 50% of the power generation being renewable. The challenge will therefore be managing the coexistence of decentralised and centralised energy production and the need for a smarter distribution grid to accommodate them.

With the development of distributed energy resources, the energy consumer is becoming active as they can generate, self-consume, store and exchange energy.

Furthermore, their flexibility could be valued on different energy markets (including balancing-ancillary services markets) provided that market design rules value flexibility properly. Smart, integrated, connected buildings will be one critical source of such flexibility, demand response, storage and flexible generation.

All consumers (citizens, businesses, public organisations) are becoming active consumers either directly, or through communities or aggregators. The increasing role of local authorities should be encouraged.

[4] Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity COM (2016) 864 final/2 of 23.02.2017

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4. RECOMMENDATIONS FOR TURNING CHALLENGES INTO OPPORTUNITIES

As illustrated above, the global energy landscape is undergoing a fundamental and rapid change primarily due to decarbonisation, decentralisation and digitisation ("the 3D change").

Considering the rapid evolution at global scale, it is urgent for Europe to adapt to these new realities: new technologies have become mature, are ever more cost efficient and offer ample of opportunities for consumers, private and professional, to actively engage in the energy market and enjoy a higher standard of living and overall well-being.

There is no doubt that a well-functioning integrated energy market is the best tool to guarantee affordable energy, security of supply and overall environmental sustainability of Europe's energy system:

Orgalime believes in a truly integrated, competitive, consumer centred, flexible, efficient, decarbonised and more decentralised electricity market to deliver clean, affordable and secure electricity for all Europeans.

We support setting in place a more modern, competitive and flexible set of legislative arrangements to govern the generation, transmission, distribution and end use of electricity, including the use of electricity infrastructure, so that the benefits of the Energy Union, the 2030 Energy and Climate Framework and Paris Agreement are indeed brought to consumers, businesses, industry and society as a whole.

In addition to these points and the key take-aways mentioned in chapter 2 of this paper, Orgalime raises the following key recommendations for the long-term EU GHG emission reduction strategy:

- Orgalime supports designing the long-term EU GHG emissions reduction strategy as **a vision on how the EU can help creating a modern, clean and competitive economy** that not only protects the planet and defends its people, but also empowers its economy and prepares us all for a future that is **more electric, more sector-coupled, more resource and energy efficient, more low carbon, significantly more local but interconnected and digitally enabled**. It needs to be designed as a European project with empowered citizens, cities and communities at its core.

- Fully acknowledging the challenges of such an ambitious strategy and the need of a robust, rule based global order for the competitiveness of European industries, Orgalime believes in **Europe's capacity of turning challenges into opportunities** and **to lead in the global market for clean technologies**. The long-term EU GHG emission reduction strategy should prioritise removing **barriers to clean tech development and investment and send the right signals** to accelerate technology development and deployment in the EU and globally. **The Paris implementation process needs to provide a true EU and global market perspective for Orgalime industries to remain in a position to keep the high investment of our industries in clean technology development.**

- A **horizontal approach** of tackling GHG emissions from all parts of the economy, including the buildings, transport, energy, land use/agriculture and industry sectors, should build upon **technology neutrality**, **increased speed of implementation** and **stakeholder engagement**. **Social and skills aspects** should be looked at as well as how to build an EU ecosystem that fosters **EU industrial, economic and political leadership** and **global competitiveness.** An abundance of technology solutions exists today for enabling decarbonisation throughout the economy, from efficiency to renewable energy, energy management, buildings, power-to-x and smart grids technologies to name but a few. The issue is making EU and global markets respond.

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- The EU's long-term GHG reduction strategy should **set the right level of ambition to reach the Paris climate targets.** Studies show that reducing GHG emissions within the range of 80-95% is technologically possible while economically and socially viable (e.g.: BDI Klimapfade Studie). **Reducing GHG emissions between 80-95% by 2050 is without alternative.** Keeping global temperature increase well below 2.0°C and to pursue efforts to limit increase to 1.5°C above pre-industrial levels, however, requires achieving a balance between emissions and removals as soon as possible during this century. This scenario should therefore be included as well in the EU's forthcoming strategy. Implementing the Paris Agreement requires a global effort of net-zero GHG emissions by 2050. **The EU should take every effort to drive the global community to this ambition.** No doubt, this transition will be challenging, but Europe has a window of opportunity to lead the Paris implementation and promote EU technology leadership.

- **The next decade will be critical to implement the Paris Agreement and should prioritise action where it is most certain to deliver emission reduction, most beneficial and the least costly. We advocate for implementing the following no-regrets actions:**

    - **Boost efficiency at all levels**, including energy efficiency but also increasing the efficient use of resources from a wider perspective: the **co-benefits of achieving energy efficiency in a wider resource efficiency agenda** should contribute to meeting the goals in a faster and cost-efficient manner. **Energy neutrality of the water sector** will also become increasingly important. The more efficient use of energy, water, raw materials, chemicals, soil or other resources in the broader sense throughout the economy will contribute to reduce Europe's carbon footprint and simultaneously benefit the circular economy.
    - In terms of energy end use sectors, strive for **more electrification and alternative fuels deployment in the transport, buildings and industry sectors** and **promote sector coupling**, especially in between transport, buildings, ICT and energy sectors but also between electricity and gas sectors (power-to-x technologies, EV infrastructure in buildings, energy management technologies etc.).
    - **In the energy sector**, boost **a highly energy efficient and renewable based EU energy system with smart grids at all levels, but at distribution grid in particular,** and implement **all flexibility sources** in the EU's energy system (flexible generation, storage, demand side flexibility and interconnection). **Gas** will still be needed in the transition, especially until storage will be fully deployed and economic. In particular, gas will be able to provide flexibility at generation side during the low carbon transition. A stable gas quality is crucial in this context.
    - **In the transport sector**, accelerate the roll out of alternative fuels and related public charging infrastructure. Please see our latest recommendations here.
    - **In the building sector**, promote smart technologies, connected buildings and communities, and target all public buildings. The roll out of electric vehicle infrastructure in buildings should be accelerated.
    - **In industrial sectors**, apply even more advanced, digitally enabled resource and energy efficient industrial processes and equipment and facilitate industrial symbiosis (where the waste of one company turns into a resource for another) or carbon capture and utilisation (CCU) as a further means for creating synergies with the circular economy.
    - **Invest in high tech infrastructures**, such as 5G, fibre or smart grids, which are a prerequisite for bringing the benefits of the ongoing digital, clean energy, low carbon and circular transformations to citizens and therefore for delivering on the Paris implementation (please see our detailed recommendations here).
    - **In all sectors, including the agriculture and land use sector, digitalisation will be a key enabler of the optimisation and real time management of resources,** be they energy, water or other. EU legislation should build in sufficient flexibility to let this innovation happen in Europe.

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- **Technology neutrality is essential – let market forces play**: it is impossible to predict the technologies that will exist in 2050. A "clear direction of travel" with clear and consistent policy objectives, targets and frameworks is in our view best to support market driven innovation while leaving concrete technology choices to the market.

- The low carbon transition needs to be underpinned by a **financial market framework that rewards clean technology development and investment in the EU,** considering that the economic consequences of not acting will be much higher than not acting or delaying climate action. Please see our detailed recommendations on strategic public infrastructure investment here).

- The Strategy should **include steady, long-term price signals** to be economically efficient, to allow timely adoption of low-carbon technologies and to minimise the amount of stranded energy assets. While we observe positive effects of the latest reform of the EU Emission Trading System, its long-term effects remain uncertain and speculative. The upcoming review of the EU energy taxation framework offers the opportunity to explore making use of this framework for incentivising the uptake of innovative technologies, including alternative fuels infrastructure.

- **EU Industry needs a global level playing field:**
  With a view to 2050, we should strive for convergence of carbon prices at world level in different policy instruments, including cap and trade systems or carbon taxes. Orgalime believes in a structured dialogue with its trading partners to promote the exchange of know-how on carbon price trading systems and sequentially fair free trade of environmental goods. It is crucial to push for a global level playing field for European companies, to promote environmental protection and EU global technology leadership. European technology manufacturers need a robust international playing field, including for trade and for carbon dumping.
  Decarbonisation will have a positive effect on industry's carbon footprint. However**, a fair, measurable and verifiable mechanism** is essential for **a level playing field between products manufactured in the EU and imported goods**. The Ecodesign and Energy Labelling frameworks provide such a framework for our sector. We remain committed to its successful implementation, through which our industry has to date contributed to realising almost half of the EU's 2020 energy efficiency target (see position papers here and here).

Orgalime representing the European Technology Industries stands ready as a stakeholder to actively contribute to these important actions, which, in our view, will not only contribute to realising our energy, climate, transport and environmental objectives, but at the same time increase consumer satisfaction and overall societal well-being. Besides, such a proactive, innovative policy would also secure the EU's position as the home of leading-edge ICT-enabled industrial innovation, generating local jobs and growth in Europe.

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