RGI Response to the Roadmap for the development of the EU strategy for Smart Sector Integration

To reach climate neutrality as soon as possible, a massive increase of renewable energy sources (RES), in particular solar and wind, is needed in combination with a significant increase of energy efficiency and conservation investments in all sectors. The Renewables Grid Initiative (RGI) is committed to the sustainable development of the electricity grids necessary to support and enable the integration of rapidly growing RES. Expanding the grid to connect RES to consumers and facilitate the use of RES across Europe is an essential and efficient way to decarbonise the economy.

However, a RES-based energy system will need more than grids to provide the required system flexibility. Additional significant structural changes are needed to efficiently achieve and successfully manage the energy transition. New flexibility options need to be developed to control frequency and voltage, and the enhancement of existing technologies as well as the creation of new ones is needed to provide energy storage, among others. At the same time, ensuring transparent, non-discriminatory, efficient and safe access to almost real-time energy data by users and service providers is essential in order to activate smart sector integration.

A comprehensive and holistic policy approach to 'sector coupling' is needed. This approach should primarily focus on renewable electricity and, to a lesser extent, renewable gas, including all sectors which have the potential to provide flexibility and optimisation opportunities for the system. The "EU strategy for smart sector integration" should therefore cover renewable energy options beyond 'Power-To-X' to include solutions for the integrated energy system.

There are multiple benefits arising from sector coupling which support the initiatives for (1) provisioning of flexibility from other infrastructures, including but not limited to gas networks and (2) upscaling 'Power-to-X' (P2X) plants to gain experience with their operation. But going beyond this, a broader definition of sector coupling will help to incentivise R&D investments in technologies which can provide short term flexibility resources as well as technologies that can provide seasonable energy storage.

Defined in a broader sense, smart sector integration should help deliver:

1) Decarbonisation of all sectors

The coupling and integration of decarbonised energy production with other sectors should help in delivering carbon neutrality as early as possible, at the latest by 2050, and reduce emissions in accordance with the Paris Agreement. However, sector coupling and a generally electricity-based economy are not a solution *per se* unless the increased electrification rate is based largely on

renewable energy sources. While in 2019 overall renewable electricity in the EU reached about 34% of all power consumed and CO2 emissions in that sector declined by more than 10%, the progress is very unevenly distributed among EU member countries. Expansion of renewables also needs to cover the currently fuels-based economic sectors which still provide about three quarters of total energy consumption.

Nevertheless, broad and timely expansion of **electrification is a key measure because of the maturity and efficiency of technology options already available in the power sector,** not forgetting the effort still needed for system integration**.** Similarly, in sectors more difficult to electrify such as heavy industry, long haul transport, shipping and aviation, sector integration in general and P2X (renewable fuels and gases) in particular can make a valuable contribution. Difficult-to-decarbonise sectors comprise about one third of all fossil fuel-related CO2 emissions. Therefore, it is **important to ensure that all energy carriers become ultimately carbon free in order to avoid that sector integration becomes a driver for a new lock-in** that will hinder and finally jeopardise full decarbonisation across the broad energy sector.

In addition to heavy industry, the sectors in most need of regulatory changes to support their road to decarbonisation are:

a) The transport sector

In addition to massively expanded electrified public rail, bus, metro and tram transport and in order to efficiently and quickly decarbonise light vehicle road transport, we need a regulatory framework and practical smart solutions that allow for everyone to use electric vehicles (EV) as comfortably as they use combustion engine vehicles today. The most important aspect here is to allow users to charge their vehicles when they need to. No solution should hinder this and smart charging (using available energy in an optimised way) should be incentivised in line with the capacity of the electricity system. Without this, quick penetration of wide scale EV usage will not happen. Single standardised charging plugs should also be implemented as a way to facilitate/enable charging across regions.

This implies that we need to strategically plan the charging architecture and significantly increase the number of public chargers currently available in the European Union (185,000 as of early 2020). If planned in coordination with generation infrastructure and the roll out of large public electric fleets (e.g. busses or service vehicles) synergies and costs reductions can be achieved. Moreover, **strategic planning should assess and deliver the potentials of electric vehicles' grid services** (e.g. through temporary storage or balancing out loads). In this context, priority to integrate many more electric vehicles into the grid has to be given to the connection criterion (e.g. determining when the vehicles should be providing or drawing electricity from

the grid at any given time) and to a market design that allows for and rewards bi-directional and time variant charging (an approach that has proven to work well in California) as well as providing services to the distribution grid, which owners of large fleets could be obligated to provide.

To achieve the above, sharing and cooperation are key – not only between distribution system operators (DSOs) and fleet operators, but also between DSOs and transmission system operators (TSOs).

b) The building sector (heating and cooling)

The maximisation of RES in the heating and cooling of all private and commercial buildings is another highly relevant factor on the road to full decarbonisation. Energy legislation for the building sector should address the different requirements of individual building typologies (e.g. newly built, existing building stocks and future new builds) and provide clear regulations and urban quarter-based solutions.

Technically, many solutions to create renewable-based and low/zero energy-advanced housing are already available today. However, many of these solutions are not appropriate or affordable enough for a broad consumer base. Regulations and supporting mechanisms must play an important role in the deployment of measures. **Regulation related to retrofitting buildings should request and support the existing "low-energy building" standards and nearly zero emission buildings. Regulation related to new buildings, however, should require zero or even "plus energy" housing systems and the optimal use of available technologies including on-site renewables for power, heating and cooling.** In the future, buildings should contribute to additional renewable energy production for the benefits of the entire society – from zero energy passive houses to "plus energy" buildings. In the context of electrification, buildings – just as electric vehicles – can be seen as a source of storage and flexibility that can help manage a renewables-based energy system.

As we move forward, legislation and standards on the principles of circular economy such as reducing, reusing, recycling need to be applied to all sectors including mineral and Rare Earth use in electric storage/batteries, renewable energy technologies, transmission grids and building infrastructure.

c) The gas sector

The Renewables Grid Initiative promotes the quick deployment of renewables, in particular of wind and solar. We do, however, acknowledge that not all sectors (i.e. energy-intensive heavy industries like fertilisers, steel, cement and plastics/chemicals production) can be fully electrified and that

there is a role for renewable gases in the transition to a carbon-free energy system. Next to these specific sectors, renewable gases also are seen as complementary energy carriers for adequacy of the electric system.

We urgently need to define the optimised specific uses of gases required for a full decarbonisation. In this context, **the terminology 'renewable gas' (or 'green hydrogen'), should be reserved exclusively for gases produced from renewable energy sources**. This will contribute to a quick decarbonisation and reduce lock-ins while providing flexibility to support a secure system operation. It is important that a 'renewable gas' or 'green hydrogen' market is established for sector integration and grid stability.

In addition, **P2X plants intended for sector coupling should have a market based open access so that all players active in the energy market can make the best use of it.** Pilot projects developed in collaboration between electricity and gas TSOs can be useful to test these technologies during their early stages.

Such a holistic approach will better support decarbonisation, minimise the total costs and impact of infrastructure and provide a level playing field for market actors.

Relevant for the renewables-based electrification of all three sectors discussed above is an affordable cost of electricity as well as the promotion of and legislative support for renewables overall, including priority grid access. A system based on **renewables calls for more new flexibility than one based on conventional power.** To optimise the system in a way that renewables-based electrification becomes effective, we need clear, more ambitious European and national legislation on RES targets and the currently non-electric sectors; medium and long term price signals; and a much closer cooperation between TSOs and DSOs that allows for coordination and exchange of data in real time to boost a steep increase of renewables in the overall system.

2) Flexibility options

In view of the radically changing energy mix and to continue operating the electric system safely, it will be **necessary to exploit new flexibility resources** and, consequently, to **build a regulatory framework that can ensure their development, market participation and remuneration while taking into account the different capabilities of each technology such as variable RES, electricity demand response and electricity storage options not limited to batteries. On the industry side, market and regulatory conditions must be created in order to be able to purchase renewable electricity flexibility.**

A **progressive effort is needed to digitalise the electric system** in order to **observe, control and monitor the ever-increasing number of resources** that

actively interface with the grid, reduce the connection/activation costs and make it easier for small prosumers to contribute.

For the most stringent roll-out of flexibility options, **coordination has to happen at all levels – pan-European, national, regional and local – to better define and adjust to the way forward in joint scenarios**. Flexibility will also be needed across different voltage levels, be it in transmission or distribution networks. First and foremost, a process of standardised data exchange and real-time communication between TSOs and DSOs is needed and should be explored via pilot projects.

Please note that RGI is currently working on more detailed flexibility recommendations that will be published in the near future.

3) Better use of infrastructure

We need to upgrade and expand the energy infrastructure exponentially to realise an energy system based on renewables. Sector coupling should contribute to optimising the utilisation of all existing infrastructure and reduce the need for future isolated, costly and late infrastructure investments. Moreover, the optimisation process should include system security, investment needs and costs, efficiency and impacts on both nature and communities. When properly planned and synchronised early-on with other implementing actors in the renewable energy community, investment savings, lower operational costs as well as reduced environmental and societal impacts can be achieved.

The “EU strategy for smart sector integration” should consider and include coordination among different sectors and collaborative planning, including the integration of all decentralised energy and flexibility resources, to best utilise future opportunities while driving decarbonisation towards maximum renewable energy supply. Under the right legislative conditions, **integrated collaborative planning can facilitate reaching multiple political objectives** by addressing them on an equal basis in the very early stage of planning.

This includes respecting EU-Nature legislation and using an ecosystem approach where we look at habitats as a whole rather than just isolated infrastructure building sites. **Resilient ecosystems can actually provide benefits and support infrastructure better.**

Today, there are several good examples for successful joint planning exercises on a small scale. This needs to be expanded on a much larger scale across Europe as soon as possible in order to address the multiple challenges we are facing: the need for swiftly growing RES to mitigate climate change impacts, severe biodiversity losses, the limited amount of land available for infrastructure and competing uses as well as the overall costs of the energy transition for citizens. Policymakers should take a stronger role in requesting and **supporting large scale cross-sector collaborative planning processes, including the attainability of essential data.**

In addition, the “EU strategy for smart sector integration” should foster an economy-wide **fair and just transition for all Europeans by promoting benefit sharing and inclusion in decision-making processes** in particular for impacted communities and vulnerable households. Crucially, it should support re-skilling programmes to help address the economic and social impacts of the transition by creating job opportunities within the renewable, energy efficiency and smart energy infrastructure sectors.

About the Renewables Grid Initiative (RGI):

RGI is a unique collaboration of NGOs and TSOs from across Europe engaging in an ‘energy transition ecosystem-of-actors’. We promote fair, transparent, sustainable grid development to enable the growth of renewables to achieve full decarbonisation in line with the Paris Agreement. RGI Members originate from a variety of European countries, consisting of TSOs from Belgium (Elia), Croatia (HOPS), France (RTE), Germany (50Hertz, Amprion, TenneT and TransnetBW), Ireland (EirGrid), Italy (Terna), the Netherlands (TenneT), Spain (Red Eléctrica de España), Switzerland (Swissgrid) and Norway (Statnett); and the NGOs BirdLife Europe, Climate Action Network (CAN) Europe, Friends of the Earth Ireland, Fundación Renovables, Germanwatch, Legambiente, NABU, Natuur&Milieu, the Royal Society for the Protection of Birds (RSPB), Transport & Environment (T&E), WWF International and ZERO. RGI was launched in July 2009.