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# ENERGY INFRASTRUCTURE FOR A EUROPEAN GREEN DEAL

## BENCHMARKS FOR THE NEW TRANS-EUROPEAN NETWORKS FOR ENERGY REGULATION (TEN-E)

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## EXECUTIVE SUMMARY

In the last decade, the Trans-European Networks for Energy Regulation (TEN-E) has become a key instrument for delivering an integrated and shock resilient EU energy system. With European citizen's rising concerns over climate change[1], by the end of 2020 the upcoming TEN-E revision should reset its focus away from energy supply and onto climate-resilient infrastructure planning for the future.

Energy infrastructure is critical to the success of the European Green Deal, the renewed political mission of the Union. The EU's ability to deliver on its commitment of climate neutrality by 2050 will depend on decarbonising the energy sector, which is currently responsible for more than 75% of the EU's greenhouse gas emissions[2]. Energy infrastructure decisions often have a lifetime of several decades, making today's decisions crucial to achieving a climate neutral energy system by 2050. Energy

[1]European Commission (2020) – **Attitudes of European citizens towards the Environment**

[2] European Commission (2019) Communication on the European Green Deal - **COM (2019) 640**

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infrastructure is also the enabling piece to accelerate the transition of many sectors, for instance in the industry via electrification and hydrogen.

This briefing sets three benchmarks for successfully resetting the TEN-E regulation:

> Establish an infrastructure governance for a changing energy system;
> Redefine scope and priorities in line with the Paris Agreement;
> Support network innovation and transformation for climate neutrality.

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## Why the Trans-European Networks for Energy Regulation needs to be reset

### TEN-E is at the core of delivering the Green Deal

Energy infrastructure is critical to the success of the European Green Deal. First, the sector is currently responsible for more than 75% of the EU's greenhouse gas emissions and an enabling piece for the decarbonisation of other sectors, including industry and transport.

The discussion on energy infrastructure also sits at the crossroads of several priority concerns for this new Commission: just transition, by enabling the transition of carbon-intensive sectors and regions; research and innovation, to guarantee the framework can respond to innovation over the next decade; the renovation of building stock, in view of the upcoming Renovation Wave; the sustainable finance agenda and delivering investment (e.g. through the EIB), where this regulation can indicate investment priorities for climate neutrality.

Getting the regulation right will accelerate the transition and establish a key piece of architecture of the European Green Deal.

### The 2013 TEN-E regulation: developed in the context of a supply-side crisis

The European Union sets its cross-border infrastructure priorities and decisions primarily through the Trans-European Networks for Energy (TEN-E) Regulation. Based on a 2011 Commission Communication, this legislation was adopted in 2013 to upgrade Europe's energy networks. **Particular attention was given to ensuring the security of gas supply, as a direct consequence of the 2009 Ukraine crisis. The TEN-E also aims at joining up the EU's energy market and supporting the integration of renewable energy in the networks.**

**The current TEN-E Regulation aims at ensuring security of gas supply, joining up EU's energy market, and integrating renewables in the networks.**

To pursue these objectives, the TEN-E regulation is currently structured around **nine priority corridors and three priority thematic areas**[3]**,** addressing electricity, gas, oil and carbon dioxide infrastructure gaps in different geographic regions. It sets out the guidelines to select the Projects of Common Interest (PCIs). This label grants special status to accelerate the construction consenting process, which for many large infrastructure projects can take several years. It also determines eligibility for financial support from the Connecting Europe Facility

[3] European Commission (website) – **Trans-European Networks for Energy.** Priority thematic areas are: smart grid deployment, electricity highways and cross-border $CO_2$ network

fund and, currently, for preferential loans by the European Investment Bank (EIB).

When the TEN-E regulation was established, the 2020 climate and energy package[4] agreed in 2009 was in its early implementation phase. The TEN-E was meant to address the security of supply challenges, leaving decarbonisation efforts to the climate package, with very little interaction or coordination between the two agendas.

### Political priorities and energy solutions have evolved

Compared to 2013, the European policy and technology landscapes have significantly changed[5]. Tackling climate change is now not only one of the top concerns[6] for European citizens but also at the core of the European political agenda.

At the end of 2019, the European Parliament declared a climate emergency[7]**.** This came a few weeks before the EU Commission released a Communication on the 'European Green Deal'[8] which defines a new growth strategy for the Union and its citizens.

**The 'Green Deal' outlines a series of policies to enable a transition towards a prosperous, fair and carbon neutral society and economy by 2050.** As a first stepping stone towards the implementation of this strategy, in March 2020 the EU Commission proposed the first EU Climate Law[9]. This aims at enshrining into law the 2050 climate neutrality objective, streamlining it across sectoral legislation and set in a motion a process for aligning 2030 climate targets with it. This provides a mandate for all pieces of legislation, including TEN-E, to be brought in line with climate neutrality.

**Other institutions also took measures to align their policy with the climate neutrality objective.** The European Investment Bank (EIB) recently adopted a new Energy Lending Policy[10] which includes a commitment to phase out most

[4] European Commission (website) – **2020 climate & energy package**

[5] E3G (2019) – **Reassessing the EU's energy infrastructure needs**

[6] European Commission (2020) – **Attitudes of European citizens towards the Environment**

[7] European Parliament (2019) – **Press release**

[8] European Commission (2019) Communication on the European Green Deal – **COM (2019) 640**

[9] European Commission (2020) – **EU Climate Law**

[10] European Investment Bank (2019) – **Energy lending policy**

fossil fuels investments by the end of 2021, while directing more resources to clean energy innovation, energy efficiency and renewables.

The 'Green Deal' approach to the energy transition as a holistic and cross-cutting project is also a reflection of the increasingly wide range of tools at our disposal. The prices of renewable energy and battery storage keep declining[11], recalibrating the components of the most cost-effective investment pathway. Smart energy and demand-side solutions challenge the old supply-side focussed energy paradigm around system balance and energy security. **The rise of digitalisation, electrification, sector integration and active demand management offer a broader spectrum of solutions to boost network development.**

**Network development can rely on a broad range of solutions. Reaching climate neutrality by 2050 requires to go beyond pipes and wires.**

This continuous transformation of the energy system represents a challenge for the policy framework to keep pace. **Reaching climate neutrality by 2050 requires network solutions that go beyond pipes and wires.** The International Energy Agency (IEA) highlights that smart grids still represent a small share of network investments and signs point at a concerning slowdown in the upcoming years[12]. Only six smart grid projects were included in the last PCI list[13] and at the end of 2017, only 16 EU countries had started a smart meter rollout[14].

**To ensure the successful and timely implementation of these technologies, integrated planning is needed. The policy framework will also have to be flexible enough to adjust over time**, for instance by reviewing its priority areas based on the latest updates from the climate stocktake set out in the Paris Agreement.

### The risk of the status-quo

The TEN-E Regulation, as it stands, still prioritises projects which undermine the achievement of the Union's climate neutrality objective[15]. Meanwhile, critical infrastructure will have to be urgently deployed, for instance, to supply hydrogen to the hard-to-decarbonise sectors such as energy-intensive industries and heavy transport.

[11] Bloomberg (2019) – **Wind and Solar Power Have Become Amazingly Affordable**

[12] International Energy Agency (2019) – **Tracking Energy Integration**

[13] European Commissions (2019) – **SWD(2019) 395 final**

[14] ACER (2018) – **Annual Report on the Results of Monitoring the Internal Electricit Y and Natural Gas Markets in 2017**

[15] Forbes (2020) – **Mark Ruffalo Calls on European Parliament to Block New Gas Projects**

The development and expansion of the gas network have been one of the core priorities of the current TEN-E Regulation but is no longer needed. **Ongoing PCIs will ensure that the Union has a shock-resilient gas network**[16]**.** A recent report testing a series of disruption scenarios showed that most of the 32 gas projects in the 4th PCI list are not necessary for the security of supply in light of the EU's legally adopted decarbonisation measures[17]. If built, they will represent €29 billion worth of investments, likely to come largely out of public funds.

Besides, this priority is also at odds with the EU's aim to deepen decarbonisation. **Total EU emissions coming from fossil gas exceed those from coal as of 2018**[18]**.** To achieve climate neutrality, the European Commission expects a drop of the share of fossil gas in gross inland consumption from 21% in 2015 to 3-4% in 2050[19]. With only three decades to go and an operating lifespan of gas transmission grids of around 80 years, **additional investment into gas networks could turn into a financial liability for consumers and taxpayers and lock us into unsafe climate pathways**[20].

**More investment into gas networks could quickly become stranded assets. Meanwhile, a faster deployment of other infrastructures is needed to decarbonise the energy sector.**

**At the same time, there is a need for much faster deployment of infrastructures that reduce energy demand and help the European industry to decarbonise faster**. These, among others, include:

> An acceleration of grid infrastructure deployment to accommodate a world where renewables increasingly dominate energy supply. Already we are seeing renewables dominate electricity consumption on occasions and in specific geographies 21. With a  renewables target of 32% by 2030, this will become increasingly the norm and under-delivery of grids risks grid instability. The European Commission already estimates that 70% of the 4th PCI list are electricity and smart grid projects22.

> A stronger deployment of infrastructure to accommodate an active demand side across increasingly electrified households, industry and transport. An active demand side is needed to flatten peak demand and reduce overall investment needs: smart electrification can reduce the need for thermal

[16] European Commission (2017) – **2017 Energy Union report**

[17] Artelys (2020) – **An updated analysis on gas supply security in the EU energy transition**

[18] 878mt $CO_2$ vs 874mt $CO_2$, International Energy Agency (2019) – **World Energy Outlook**

[19] European Commission (2018) – **A Clean Planet for all**

[20] E3G (2017) – **Infrastructure for a changing energy system**

[21] 11 EU countries already had an average share above 20%, 3 above 40% in 2017/18 (**EEA/Eurostat 2019**). **Germany** already had short periods of time of 100% renewables electricity, **Portugal** for four entire days.

[22] European Commission (website) – **4th List of Projects of Common Interest**

back-up by up to 54% and renewables curtailment by up to 70%.23 However, the last PCI list only had 6 smart grid projects.

> The deployment of zero-emission hydrogen for hard-to-decarbonise purposes such as high-temperature heat in industry. Currently, hydrogen infrastructures are not eligible to become PCIs.

## Benchmarks for resetting the TEN-E regulation

**Establish an infrastructure governance for a changing energy system**

The developments in the energy system raise a question mark on the suitability of the current infrastructure policy architecture. **Infrastructure needs are currently identified by supply-side stakeholders in electricity and gas – the transmission system operators. For a changing energy system, new expertise is required in infrastructure planning.** Examples of new needs for expertise include:

> the role of a more active demand side

> the impact of rolling out large scale energy efficiency measures

> the further integration of sectors and networks beyond electricity, gas, notably heat, hydrogen, carbon dioxide, transport and industry.

> the impact of different climate change scenarios on energy system performance and demand.

**These developments require to triage infrastructure needs across all these sectors and solutions**. Views over risks and opportunities associated with each option need to be based on best available evidence, including on what climate science tells us over how the needs and performance of the energy system will change.

The current policy infrastructure framework requires the European Network Transmission System Operators (ENTSOs) to develop the so-called Ten-Year Network Development Plan (TYNDP) every two years. This masterplan provides considerable technical data to inform decision-makers and identify projects of European significance, which are then eligible to get the PCI label.

[23] European Climate Foundation (2019) – **Fossil-Free Energy 2050**

The first joint scenarios by ENTSO-e and ENTSO-g to deliver the 2050 climate goals is a first step to integrating across gas and electricity. But this still raised concerns among NGOs[24], businesses and trade associations[25]. For example, the high share of gas supply in the energy mix until 2040 **is not only in contradiction with the EU's 2050 modelling, but the limited range of scenarios limits the exercise's usefulness for planning a resilient energy system.**

Further, while in all ENTSOs' scenarios the assumptions on mature technologies such as renewable energy growth rates, energy efficiency and demand response are modest, assumptions around the deployment of carbon capture technologies (CCS and BECCS) are bold[26]. **Political choices such as these need to be informed by independent, expertise based on the latest science and evidence and taken by decision-makers with a political mandate to protect citizens' interests.**

**A new delivery model is necessary to identify climate-proof infrastructure needs and to achieve climate neutrality in a cost-effective way.**

**This suggests that the current system does not provide the information needed to deploy the infrastructure necessary for the pace of innovation and decarbonisation needed.** The narrow range of outcomes and the lack of transparency on the risks associated with each pathway prevents decision-makers from taking a calculated choice, monitoring and managing the related risks adequately.

According to the Agency for Cooperation of Energy Regulators (ACER) "the owners of those network assets have a vested commercial interest in how those assets are used and developed, and so may not be incentivised to encourage more economic alternatives to come to the market through forward-thinking and planning"[27]. The report also highlights the need to check future investment in fossil gas to ensure consistency with the decarbonisation targets.

A new governance for determining infrastructure needs in a world of multiple infrastructures and of rebalancing from the supply to the demand side is needed. To this end, three core functions are required[28]: an **independent technical expert body, a revised system architect, and delivery functions operating at EU,**

[24] EEB - CAN-Europe (2020) – **TYNDP scenarios need to become Paris-Agreement and EU Green Deal truly compatible**

[25] Electrification Alliance (2020) – **Comments on ENTSOs TYNDP 2020 scenarios**

[26] ENTSOs (2020) – **TYNDP 2020 scenarios** and see above referenced letters

[27] ACER – CEER (2019) – **The Bridge Beyond 2025**

[28] E3G (2019) – **EU Energy System decarbonisation policy**

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**member state and local levels.** In the framework of the next TEN-E regulation, this implies:

> A consistent set of assumptions based on the latest science and all solutions available should form the basis of infrastructure decision making. One way of doing that would be to set up a "Clean Economy Observatory" which would provide an independent, evidence-based opinion and guidance on energy scenarios.29

> A more flexible structure around priority corridors would enable the regulation to respond to recent learning. These could be updated regularly in line with the report by the Sustainable Finance Platform or recommendations by the Clean Economy Observatory on critical investment needs across the EU. For example, it may be too early to include hydrogen grids at this stage before renewable hydrogen production at scale has been demonstrated.

> These independently provided assumptions should inform a robust assessment of the wider pool of options – across scenario building and all the way through to Cost-Benefit Analysis. Current ENTSOs' scenarios are linked but do not optimise the system and disregard important solutions around heat networks, energy efficiency or demand-side management.

**The current governance also needs to improve in terms of legitimacy and accountability.** The costs of energy infrastructure are ultimately borne by the consumer and the taxpayer; thus, a stronger involvement of civil society and Parliament is recommended. Currently, the process involves infrastructure owners, regulators, the Member States and the Commission. Civil society can input through consultations and participate in some discussions but not in the decision. Regional groups are responsible to assess projects submitted for the PCI label, but these key discussions happen behind closed doors. The Parliament only has a final "yes-or-no" vote on the project list.

**Besides the overall governance architecture, the reviewed TEN-E proposal should set up a clear methodology on ex-post monitoring of selected projects.** For instance, electricity projects which get EU funding should be able to demonstrate their contribution to an increased share of renewables integration while preventing additional trade in fossil fuels.

[29] This function would preferably carried out by independent experts, or could be part of the new EC Strategic Foresight Unit. The function could be comparable to the Sustainable Finance Platform set up recently.

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**Redefine scope and priorities in line with the Paris Agreement**

In 2018, the Strategic Vision for the EU 2050 climate neutrality recognised the need for "more intelligent transition infrastructure[30]. **The scope and priorities of the TEN-E regulation need to change to address recent macro-trends of the transforming energy system**. This implies the next TEN-E Regulations should adhere to four overarching principles:

**The TEN-E regulation needs a clear link to the most recent EU climate acquis, a reviewed definition of security of supply, to apply efficiency first principle and to accelerate the transition in energy-intensive regions**

*Policy priorities must be based on updated climate and energy objectives.* The policy references in the new TEN-E Regulation must come from the climate and energy objectives agreed with the Paris Agreement, the 2030 climate targets, the Clean Energy Package, and the proposed EU Climate Law.

*Energy security is no longer a problem limited to physical supply.* In 2019, the European Commission said that "Europe should achieve a well-interconnected and fully shock-resilient gas grid by 2020 or shortly thereafter"[31]. Together with the energy system, the energy security challenges are also transforming away from a focus on import routes through the "n-1 criterion"[32], i.e. support networks' disruptions. The indicator should take into account other options of delivering energy security (e.g. reducing demand[33]) and also reflect new challenges related to cybersecurity, climate impacts and system balancing[34]. The n-1 criterion should be removed and new **measurable criteria set out to reflect the renewed definition of energy security and ensure comparability and accountability in decision making.**

*Apply the efficiency first principle.* Even if in 2019 $CO_2$ emissions remained static[35], the Union will struggle to achieve its 2050 target if it does not put the efficiency first principle as the cornerstone for future infrastructure planning[36]. The EU Member States are under-delivering on energy efficiency and contributions planned in the national energy and climate plans are not

[30] European Commission (2018) – **Strategic Vision for the EU 2050**

[31] European Commission (2019) – **Fourth Report on the State of the Energy Union**

[32] Anchored in the annex of the TEN-E regulation. N-1 criterion means the network must be able to withstand the (temporary) loss of the biggest asset on the network

[33] Energy Union Choices (2016) – **More security, Lower cost**

[34] E3G (2017) – **Infrastructure for a changing energy system**

[35] Financial Time (2020) – **Flat carbon output in 2019 raises hope that emissions have peaked**

[36] In the EU **Governance Regulation** (2018), "Energy Efficiency First" is defined as "*taking utmost account in energy planning, and in policy and investment decisions, of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy, whilst still achieving the objectives of those decisions*"

promising, setting the Union up to for falling short by 4.2 percentage points on its 2030 target[37]. **To address this challenge, energy efficiency first needs to be incorporated across scenario development, project evaluation and project eligibility.**

> Scenario development and project evaluation: A scenario with higher energy efficiency deployment could be incorporated for supply-side projects to be tested against. Alternatively, at Cost-Benefit-Analysis stage, supply-side projects should be compared to an alternative reducing demand.

> Project eligibility: different reports highlight how aggregated building renovation projects could be considered infrastructure projects at equal footing as a supply-side measure[38]. This could give a "delivery tool" to the upcoming Renovation Wave announced by the European Commission. The recent smart grid projects that allowed "virtual aggregation" could be an example of how to interpret this in the context of the need for a cross-border impact[39].

*Accelerate the transition in carbon-intensive regions*. Reaching climate neutrality implies radical transformations that will have an impact on energy consumers. Investments in clean infrastructure projects in high carbon areas should be prioritised to accelerate the transition in those regions. The next TEN-E regulation should provide the needed legislative background to implement the cross-border renewable energy projects set out in the upcoming post-2020 Connecting Europe Facility. This could be a facilitator of boosting clean and reliable electricity in coal and heavy industry regions in particular; and support the objectives of the Just Transition Fund – of course, conditional on a regional or sectoral climate neutrality plan.

### Support network innovation and transformation for climate neutrality

The TEN-E regulation should support network innovation and transformation towards decarbonisation. **But it will also need to ensure we keep pace and focus on delivering the priority infrastructure for climate neutrality.**

An example includes the future role of gas. In light of the EU's decarbonisation goals, the role of fossil gas will be diminishing and network utilisation falling.

[37] Coalition for Energy Savings (2020) – **The Energy Efficiency Package**

[38] Buildings Performance Institute Europe (2017) – **Safeguarding energy security in South-East Europe**

[39] E.g. the "Smart Border initiative" (DE, FR) that connects policies to support joint market integration and the "Data Bridge" (EE, LV, LT, DK, FI and FR) that enables integration of different data types across Europe. See **4th PCI List**.

Already only a small subset of the projects on the 4th PCI list serve public interest purposes[40]. **There should thus be no eligibility for fossil gas and oil infrastructure in any form.** In the medium term, as utilisation rates of the gas network decline in places, eligibility that ensures fair sharing of benefits and costs of decommissioning cross-border infrastructure should also be considered.[41]

**The next TEN-E will need to stay focussed on delivering climate neutrality**

Alternative gases will form a part of tomorrow's energy mix and the TEN-E should facilitate their scale-up. The Union needs to already start planning for the infrastructure that will allow the use of alternative gases such as hydrogen. However, solutions compatible with net-zero emissions currently still are low in supply and maturity. **A flexible structure that allows reviewing eligible energy infrastructure categories regularly would allow to include hydrogen networks as soon as a higher level of deployment is achieved.** At present, dedicated hydrogen networks are excluded from the TEN-E categories and in the medium term, once zero-emissions solutions reach scale and maturity, their eligibility should be considered.

If included, the following principles should be used to select investments in alternative gas infrastructure:

> Given low efficiency, maturity and limited sustainable domestic supply of hydrogen[42], focus should be **on where no cheaper or more efficient decarbonisation options are available. This means focussing on hard to decarbonise services and sectors**. These include high-temperature heat for heavy industry (steel, cement and chemicals) and fuels for heavy transport (aviation and ships). The need for hydrogen in the industrial sector alone would exhaust the bottom end of the range of sustainably available hydrogen in Europe[43]. Eligibility should be conditional on regional industrial strategies towards climate neutrality[44].

[40] Artelys (2020) – **An updated analysis on gas supply security in the EU energy transition**

[41] Frontier Economics (2019), **Potentials of sector coupling for decarbonisation**, p. 141

[42] Estimates range from 1/10th to a 1/4th of today's gas consumption. See for example:

Gas4Climate (2018), **How gas can help to achieve the Paris Agreement target in an affordable way**, and ICCT (2018), **What is the role of renewable methane in European decarbonisation?**

[43] While this comparison is only indicative because of different assumptions and unit conversions, the analysis behind the EU long term strategy (Figure 34) estimates s about 26-29mtoe of H2 in industry, while ICCT estimates about 30bcm (ca 27mtoe) of domestically produced renewable methane to be technically available by 2050.

[44] E3G (2020) – **Fostering Climate-Neutral, Energy-Intensive Industries in Europe**

- **Focus eligibility of hydrogen networks on where long-term sustainability is possible.** To be compatible with net-zero, hydrogen will eventually need to be produced from renewable electricity[45]. While some argue that hydrogen from fossil gas combined with carbon capture may be used in the transition, significant upstream methane emissions make it unlikely to become compatible with climate neutrality[46]. Uncertainty over the cost and deployment rate for carbon capture infrastructure make it difficult to assess a business case – with a possibly higher long-term cost reduction potential for electrolysis hydrogen[47]. Priority should be given to **hydrogen networks that are developed and optimised in accordance with renewable energy supply and the electricity grid to ensure long term sustainability.** Consideration could be given to allowing the joint application of electrolyser, renewable energy and grid projects in this context.
- Where existing gas pipelines offer solutions meeting the above criteria, their conversion to hydrogen should be eligible. A mere "hydrogen readiness" test is not sufficient, instead:
    - **Measurable and transparent indicators should be used to ensure delivery of the public interest case, i.e. a transition to climate neutral energy supply.** The risk of non-delivery of zero-emissions hydrogen gases needs to be minimised.
    - **A mere blending of hydrogen will not be sufficient to achieve climate neutrality.** A strategy for full conversion, with adequate measurable milestones (e.g. an average emissions factor at different points in time), needs to be presented. The potential for climate neutral supply of hydrogen should be analysed.
    - **The cost-benefit analysis should reflect the full cost and demand impacts of conversion from fossil gas to hydrogen**. First, the lower energy content of hydrogen and the latest costs per unit of energy assumptions need to be reflected. Second, costs for retrofitting other parts of the network, e.g. end-use appliances

[45] E3G (2018) – **Renewable and decarbonised gas – options for a zero-emissions society**

[46] While global methane leakage from gas production is still underexplored, recent research suggests that the share of fossil fuels in global methane emissions has been underestimated by between 25-40%. Source: Scientific American (2020), **Methane Emissions from Oil and Gas May Be Significantly Underestimated**

[47] This reduction is driven by learning rates in electrolysis technology, but even more so by increasing shares of low cost renewables becoming available. Source: Carbon Brief (20 February 2019), **Renewable hydrogen 'already cost competitive', say researchers**

should be included in the cost-benefit analysis and the comparison with alternative options.

> Biomethane will play a role in specific geographic conditions at the distribution level, rather than become a generic bulk solution. This raises a question over its fit with the more transmission and cross-border focused TEN-E regulation. If included, TEN-E eligibility could be given where accommodating biomethane at distribution level reduces the need for transmission infrastructure. Sustainable sourcing of the biomethane and a clear trajectory to climate neutrality needs to be ensured.

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## SUMMARY: Benchmarks for resetting the TEN-E regulation

**Build an infrastructure governance for a changing energy system.**

> Provide a consistent set of assumptions for energy infrastructure planning as an independent triage of the full range of new energy solutions, for example by creating a Clean Economy Observatory.

> Regularly review eligible infrastructure categories to reflect the fast pace of change in energy, based on independent expert advice.

> Increase accountability and legitimacy throughout the infrastructure selection process (assessment needs, identification of projects) through more civil society and Parliament involvement and strengthened ex-post monitoring.

**Redefine scope and priorities in line with the Paris Agreement**

> Require compliance of all projects with the Paris Agreement, the EU's 2030 climate and energy targets and the EU Climate Law.

> Re-define the regulation's definition of energy security in light of new challenges (climate risk, cybersecurity) and use measurable indicators.

> Embed the 'efficiency first principle' throughout scenario development, project evaluation and eligibility.

> Accelerate the transition in currently carbon-intensive regions and sectors, where a plan to 2050 climate neutrality is in place, by developing grid infrastructure to accommodate high shares of renewables.

> Establish a legal basis for renewable projects of common interest.

**Support network innovation and transformation for climate neutrality**

> End eligibility of fossil fuel infrastructure (oil and gas).

> Target support for hydrogen networks where no alternatives are available and make it conditional on net-zero sectoral or regional plans.

> Accelerate climate neutral, renewable hydrogen by developing and optimising the hydrogen network together with electricity grids and renewable energy supply.

> If converting gas networks to hydrogen, require a strategy for retrofitting end-use appliances and securing zero-emissions supply. Require promoters to include measurable milestones and reflect full costs in the cost-benefit analysis. This will avoid conflict of interests and enable the monitoring of public benefits delivery.

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## About E3G

E3G is an independent climate change think tank operating to accelerate the global transition to a low carbon economy. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere. In 2018 for the third year running, E3G was ranked the fifth most influential environmental think tank globally.

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