Opinion of the European Committee of the Regions — Towards a Roadmap for Clean Hydrogen — the contribution of local and regional authorities to a climate-neutral Europe

(2020/C 324/07)

Rapporteur: Birgit HONÉ (PES/DE), Minister for Federal and European Affairs and Regional Development (Lower Saxony)

Reference document: Own-initiative opinion

POLICY RECOMMENDATIONS

THE EUROPEAN COMMITTEE OF THE REGIONS

Importance for a climate-neutral EU by 2050

1. warmly welcomes the European Council's approval of the target of a climate-neutral EU by 2050 and that the European Commission is aiming to enshrine this target in EU law with its proposal for an EU climate law ([1]);

2. stresses the importance of generating environmentally and socially sustainable growth, especially in the wake of the COVID-19 crisis. The European Green Deal ([2]), with energy- and resource-efficient, climate-friendly technological and social innovations, must be a key element of post-COVID-19 economic recovery. As one such future technology, clean hydrogen must now be vigorously promoted in the EU;

3. therefore emphatically welcomes the Commission's presentation of an EU hydrogen strategy, anticipating the recommendations of this opinion ([3]); is also pleased to note that the revised proposal for the EU's 2021-2027 multiannual financial framework with an accompanying recovery plan makes the development of a clean hydrogen economy much more feasible, and calls on the Council and the European Parliament to keep these options in the legislative process;

4. points out that the goal of climate neutrality implies a complete transformation of electricity, cooling, and heat supply and, in particular, requires profound changes in industry and transport. A range of different renewables-based technical solutions will be needed. But accelerating promising technologies requires technology-specific support. Clean hydrogen and derived synthetic feedstocks and fuels ([4]) will be essential for achieving this goal in the future and should therefore benefit from specific support. In this regard, particular emphasis should be placed on green hydrogen from renewable energy sources;

5. believes that at this early stage of market development, an open approach with regard to the potential applications of clean hydrogen would be a good idea as certain amounts of clean hydrogen could realistically be used by many sectors. The CoR considers it necessary to focus on promising applications as the market develops;

6. emphasises in this connection that using clean hydrogen and e-fuels is less efficient than directly using renewable electricity due to conversion losses, which is also likely to lead to higher costs for many applications in the long term. For this reason, in the medium to long term, the priority applications of clean hydrogen/e-fuels will be considered to be areas

([1]) Proposal for a regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law) (COM(2020) 80 final).
([2]) Communication from the Commission — The European Green Deal (COM(2019) 640 final).
([3]) See Roadmap — Ares(2020)2722353.
([4]) For the sake of simplicity, the term 'e-fuels' will be used to denote synthetic fuels in the rest of the opinion.

where hydrogen is used as a raw material or where energy efficiency measures and direct electrification are not viable solutions (e.g. ammonia and steel production, heavy-duty and long-distance transport, high-temperature processes and seasonal electricity storage) and parts of the built environment/district heating, where heat pumps or heat networks are not effective;

7. suggests that the Commission assess the production potential for green hydrogen in the EU, including in the less developed NUTS 2 regions, and neighbouring regions (e.g. the Middle East and North Africa), with particular regard to competition with the direct use of electricity from renewable energy sources because comprehensive and detailed knowledge of the feasible potential for various scenarios would be an important basis for developing a green hydrogen economy in Europe; in addition, it could be analysed to what extent blue hydrogen can be used as a transitional solution;

8. recommends that the Member States promote a green hydrogen economy when updating their national energy and climate plans (NECPs) in 2023, and devise integrated national hydrogen strategies with implementing measures in close cooperation with all stakeholders. When drawing up and implementing these projects, the Member States should work closely with the local and regional authorities (LRAs) or their national and regional associations as well as the scientific community. It is recommended that every Member State examine the potential for producing green hydrogen;

Sustainability aspects

9. stresses that, in the long term, hydrogen obtained through the electrolysis of water using electricity from renewable energy sources (green hydrogen) is the only sustainable method of producing hydrogen. The EU and the Member States must therefore focus their efforts on green hydrogen when developing a hydrogen economy. Until sufficient quantities are available, temporary technological solutions — such as blue hydrogen — can help to reduce CO_2 emissions from existing hydrogen production. It must be ensured that this does not hinder the switchover to green hydrogen when developing a hydrogen economy. The temporary solutions must provide actual and significant benefits in terms of cost and speed of implementation compared to green hydrogen and must not create long-term path dependence;

10. considers a comprehensive and transparent sustainability classification and certification for hydrogen/e-fuels to be vital, as well as the extensive and mandatory use of the certificates developed from these. A market for green hydrogen can only develop with certificates that are designed to be strict, clear and differentiated and that also enable a distinction to be drawn between blue and green hydrogen. The CoR calls on the Commission to actively advance the gas classification process in the European Gas Regulatory Forum (Madrid Forum) and to act swiftly to put forward a proposal for a classification and certification system in line with the existing legislation on the authentication of renewable energy; in this connection calls for the possibility to be examined of merging the existing parallel systems of guarantee of origin (Article 19, RED (Renewable Energy Directive) II) and sustainability certificates (Articles 25-31, RED II). The Commission should champion the worldwide adoption of the certificate/guarantee of origin system that will be developed in the EU;

The specific role of the regions

11. emphasises that green hydrogen can be produced and used in a decentralised way and can therefore be part of a more decentralised energy supply in the future, as set out in the Commission's long-term strategy 'A Clean Planet for all' ([5]) and supported by the CoR ([6]). Green hydrogen has the capacity to promote regional and local development because significant parts of the value chain can be established in regions and municipalities and so have beneficial effects on employment and SMEs; also, the excess heat from green hydrogen production can be used in the local and regional heat supply, and hydrogen that is produced as a by-product during certain processes can be recovered and used at local and regional level;

([5]) COM(2018) 773 final.

([6]) Opinion of the European Committee of the Regions — Implementing the Paris Agreement through innovative and sustainable energy transition at regional and local level (OJ C 39, 5.2.2020, p. 72); Opinion of the Committee of the Regions — A Clean Planet for all — A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (OJ C 404, 29.11.2019, p. 58).

12. explicitly stresses that LRAs have a decisive role to play in putting the hydrogen economy in place. Many LRAs are working on hydrogen strategies, green hydrogen programmes, and specific projects, for example in the ambit of the 'European Hydrogen Valleys Partnership' ([7]). LRAs are vital players for market development because of their detailed knowledge of local circumstances, their connections with local players, and their supervision of planning and authorisation processes and various regional and local funding and incentive opportunities, public procurement and powers in vocational and academic education and training;

13. notes that regions can play an important connecting role in the development of regional strategies and green hydrogen programmes to ensure integrated development of the green hydrogen value chain. The proximity of production and use makes it possible for them to first build regional hydrogen networks and then expand them over time. Centralised large-scale hydrogen supply in industry clusters can be matched with decentralised demand from industry, mobility, buildings and grid-balancing in the industry cluster surroundings, on regional, national and international level (sector coupling). Locations close to ports could be particularly attractive as they also facilitate the import of hydrogen/e-fuels in the long term. The CoR strongly urges the European Commission to support the development and implementation of such regional strategies and programmes for green hydrogen value chains and clusters;

Coordination of market development

14. reiterates that a green hydrogen market cannot develop without significant investment, including from the private sector. This can only happen if there is confidence in the market's long-term development. Ambitious and binding targets, a clear legal framework, an explicit strategy and a specific roadmap for green hydrogen can help to build confidence;

15. urges the Commission to develop an EU-wide vision in the upcoming EU hydrogen strategy, particularly for green hydrogen for 2030 and 2050, and to present a projection of the areas of application for green hydrogen, its market take-up and the promotion of further innovation, taking into account the recommendations in this opinion;

16. calls for the Commission to put forward with the EU hydrogen strategy an integrated roadmap of non-legislative and legislative measures for building a clean EU hydrogen economy, and a hydrogen single market geared to green hydrogen, building on the recommendations of this opinion and of the Strategic Forum for Important Projects of Common European Interest. The EU's hydrogen strategy should include ambitious targets for green hydrogen production capacity, based on an analysis of regional production potential, and should promote the systematic expansion of hydrogen production and use by establishing corresponding value chains. The strategy should contribute to EU-wide coordination on the development of supply, demand and infrastructure, and the coordination of regulatory activities and funding at the level of the EU, the Member States and the LRAs, with particular consideration for the above-mentioned connecting role of regions in the upscaling of production and application of green hydrogen in the energy and industry feedstock transition;

17. considers the development of a green hydrogen economy to be essential for the sustainable industrial policy pursued by the European Green Deal; points out that the upscaling of electrolyser technology to GigaWatt-scale is required for 'green' hydrogen to become cost competitive. This provides an (employment) opportunity for the electrolyser-producing industry in EU Member States with export potential worldwide. The CoR urges the European Commission to promote this. It stresses the importance of the involvement of European regions — together with industry — to develop cross-sectoral hydrogen value chains connecting supply, infrastructure and demand. The CoR urges the Commission, as part of the implementation of the New Industrial Strategy for Europe ([8]), to promote lead markets for green hydrogen technologies and systems and their use for climate-neutral production, especially in the steel, cement and chemical industries. The CoR requests that the EU strategy for clean steel announced by the Commission be quickly adopted and an appropriate focus be placed on the use of green hydrogen;

([7]) Under the umbrella of the Smart Specialisation Platform (S3P).
([8]) COM(2020) 102 final.

18. warmly welcomes the establishment of the European Clean Hydrogen Alliance announced in the New Industrial Strategy. The CoR requests that this alliance be set up quickly, focus on green hydrogen and help the EU play a pioneering role in this key technology by contributing to coordination and the exchange of knowledge and experience. The CoR calls for the involvement of the regions and SMEs in the alliance, as announced by the Commission, to be consistently implemented;

19. points out that the increasing integration of sectors through the use of the same energy sources requires a more systematic approach to sectors. The CoR stresses that the strategy for an integrated energy system and the EU hydrogen strategy ([9]) by the European Commission must emphasise the systematic importance of green hydrogen in relation to other forms of energy for sector integration, such as electricity, renewable gases and e-fuels, to the future energy and economic system and present implementation methods that benefit the system. They must present implementation methods that benefit the system and use new and tailored market rules to engender a functioning market in hydrogen that, on the one hand, galvanises hydrogen production and use and, on the other, is well integrated with the electricity and gas markets;

Supporting framework legislation and infrastructure development under the European Green Deal

20. stresses that the dynamic expansion of renewable energy in electricity generation is the basis for the development of the green hydrogen market in the EU. The CoR calls for the Renewable Energy Directive (RED II) to be revised as a result of the EU's more stringent 2030 climate targets, in particular by raising the EU target for the share of renewable energy in gross final consumption of energy accordingly; encourages Member States and LRAs to set ambitious national, regional and local targets for expanding renewable energy, such as wind and solar energy; The CoR expects the renewable offshore energy strategy announced by the Commission to boost this sector, including by funding innovative off-shore green hydrogen production projects;

21. calls on the Commission to examine whether RED II and delegated acts provide sufficient incentives for the use of e-fuels based on industrial CO_2 emissions and carbon capture and utilisation (CCU) in a transitional phase. However, steps should also be taken to avoid double accounting of GHG emission reductions, as well as fully counting e-fuels as 'renewable';

22. also calls for the swift drafting of delegated acts under the EER II to clarify the classification of electricity grids for hydrogen production (Article 27 EER II) and minimum GHG emission reduction requirements for synthetic fuels (Article 25 EER II);

23. emphasises that a grid- and system-friendly method of electrolysis must be ensured when using electricity grids for hydrogen production (demand-side management), and calls for the EU hydrogen strategy and hydrogen strategies at national and regional level to include the creation of additional green electricity generation capacity for electrolysis;

24. points out that the internalisation of external costs creates a level playing field and increases the economic attractiveness of green hydrogen. The CoR therefore supports a comprehensive revision of the Energy Taxation Directive with a view to aligning energy taxation with the goals of the European Green Deal and to include hydrogen and e-fuels in the scope of the Directive; encourages Member States to use the existing headroom for green taxation and to use additional revenues to lower the tax burden on low-carbon electricity;

25. emphasises that the EU Emissions Trading Scheme (EU ETS) provides significant incentives for the reduction of GHG emissions in energy-intensive industries (e.g. the chemical and steel industries), for which green hydrogen is a key option for decarbonisation. The revision of the Emissions Trading Directive should take the new 2030 climate targets into account, e. g. by increasing the linear reduction factor. Investments could be made safer by adding a minimum price to the EU ETS;

26. supports the development of a suitable WTO-compliant border adjustment mechanism for CO_2 emissions ([10]) for products imported from third countries, whose production is associated with high CO_2 emissions and that are subject to strong international competition. Such a system, combined with an adjusted EU ETS, could provide incentives for the use of green hydrogen in energy-intensive industries;

([9]) See European Commission Roadmap — Ares(2020)2722353.
([10]) See Inception Impact Assessment, Ares(2020)1350037.

27. calls for the Commission to revise the Regulation on trans-European energy infrastructure (TEN-E) ([11]) and the EU rules for the European gas market, primarily EU Gas Directive 2009/73/EC ([12]), in such a way that a green hydrogen economy can be dynamically developed, with transmission of hydrogen across the EU. This includes, for example, defining universal and clear standards (e.g. the permitted share of hydrogen in the natural gas system), appropriately adjusting the requirements for projects of common interest (PCIs) based on TEN-E, coordinating electricity and gas infrastructure planning, reclassifying existing gas infrastructure, and setting clear rules for the injection of certified hydrogen from renewable energy into the natural gas system. The regulatory basis for public hydrogen networks also needs to be developed, with non-discriminatory access. The CoR points out that building and expanding dedicated hydrogen networks is an important prerequisite for ensuring that hydrogen is available in its pure form for the priority applications for which there are no conceivable alternatives to hydrogen;

28. believes that the revision of the Trans-European Transport Network (TEN-T) Regulation should place much greater emphasis on low-carbon propulsion technologies for lorries, coaches, and inland shipping, such as electric motors powered by hydrogen fuel cells or overhead lines together with other energy forms that meet sustainability and emissions reduction requirements. Building the corresponding infrastructure, initially along core network corridors, is a prerequisite for the deployment of these technologies. The Connecting Europe Facility (CEF) should provide sufficient funding for this purpose. The revision of the Alternative Fuels Infrastructure Directive provides the opportunity to set specific requirements for the density of hydrogen filling stations in Member States;

29. calls on the Commission to allow support for creating pipeline infrastructure for the transportation of hydrogen (constructing pipelines and transforming existing gas infrastructure) and for creating storage infrastructure; the development and funding of cross-border infrastructure for hydrogen between industrial clusters provides business opportunities; cooperation with other sectors that require new energy infrastructure is advised because of spatial planning and cost-effectiveness;

30. urges the Commission to prioritise the use of green hydrogen and e-fuels to complement electric mobility in heavy-goods, public, waterborne and air transport as part of its announced strategy for sustainable and smart mobility. This requires a clear and reliable roadmap and a European legal framework to encourage the use of low-emission vehicles within existing toll systems;

Support through financial and regulatory measures and State aid

31. stresses that the development of a green hydrogen economy, in particular the expansion of production, must be supported by public funds because green hydrogen is not yet economically viable. The CoR points out that the revision of the Guidelines on State aid for environmental protection and energy should maintain or expand the leeway for funding mechanisms so as to stimulate early market development;

32. reiterates that both investment and electricity costs are relevant cost components in the production of green hydrogen. In principle, both supply and demand-side mechanisms to promote green hydrogen production are available, which can have similar effects depending on their design. Investment grants and feed-in premiums are potential supply-side mechanisms. The CoR stresses that experience in the electricity sector has shown that, a revenue guaranteed over a certain period of time can enable production capacity to expand. However, to generate competitive pressure, both feed-in premiums and investment grants could be put out to tender from the beginning;

33. emphasises that regulatory measures can generate demand for green hydrogen in certain sectors or areas of application, in turn encouraging production to expand. GHG emission reduction targets in the relevant sectors combined with measures such as binding blending quotas (e.g. air and maritime transport), GHG reduction quotas for fuel suppliers or CO_2 thresholds for fleets (e.g. for lorries, coaches or inland shipping) generate reliable demand for green hydrogen and

([11]) See Inception Impact Assessment, Ares(2020)2487772.

([12]) Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC (OJ L 211, 14.8.2009, p. 94).

e-fuels. In this connection, the CoR calls for Member States to use the existing legal leeway to promote green hydrogen/e-fuels when implementing RED II. An alternative for applications that already require large amounts of hydrogen could be Carbon Contracts for Difference (CCfDs), which compensate for the difference between users' actual GHG avoidance costs and the current price of CO_2;

34. points out that public procurement can also generate tangible and predictable demand. LRAs can play a key role in this regard, as the fleets of municipalities and municipal companies (e.g. street cleaners, waste disposal vehicles, local public transport and taxis) are increasingly proving to be good cases for using green hydrogen and other climate-neutral propulsion technologies;

35. welcomes the initiatives for creating important projects of common European interest (IPCEIs) for green hydrogen. The CoR encourages the Commission to create the legal framework for IPCEI projects for green hydrogen and encourages Member States to then make use of it to pave the way for large-scale demonstration projects. Special attention should be paid to create synergy between the various hydrogen IPCEIs to prevent 'chicken and egg' dilemmas in the green hydrogen value chain development;

36. calls for increased funding for demonstration projects for green hydrogen through the Innovation and Modernisation Funds financed by the EU-ETS and for the targeted support of green hydrogen through the InvestEU programme. The CoR encourages the Member States and regions to use the European Structural and Investment Funds (ESI Funds), including Interreg, in the coming funding period to establish and enhance regional, local and interregional hydrogen clusters. The CoR stresses the need to create synergies at all levels between these funds, IPCEIs, the CEF and research funding;

37. welcomes the energy lending policy adopted by the European Investment Bank (EIB), including the design of new financing approaches under the InnovFin Advisory Programme. In this regard, the CoR calls for the EIB to provide considerable support for green hydrogen, with financing approaches that also benefit SMEs and LRAs or their promotional banks;

38. believes that a one-stop shop at EU level could considerably facilitate access to project funding for businesses, including SMEs, and for regions and cities;

39. advises Member States to complement EU support with national programmes for scaled-up demonstration projects, living laboratories, national networks and hydrogen region exchanges, in close cooperation with the LRAs or their national and regional associations;

40. emphasises that long-term signals are needed to steer financial and capital flows from the private sector to investments in a green transition with a green hydrogen economy, including for the benefit of innovative SMEs. The CoR expects support in this regard from the Commission in the announced Strategy on Sustainable Finance;

Research and innovation

41. stresses that research and innovation also have a decisive role to play in the large-scale implementation of green hydrogen production and use. They must be geared towards lowering costs in all parts of the value chain and improving the controllability, efficiency and lifespan of facilities. The CoR therefore recommends explicitly focusing on green hydrogen as part of the Horizon Europe programme, including its 'Green Deal Missions', the Strategic Energy Technology (SET) Plan and the European Innovation Council (EIC);

42. welcomes the Commission's recommendation to implement a European partnership for clean hydrogen as part of Horizon Europe, as a successor to the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) ([13]). The CoR recommends improving the financial endowment as well as mechanism and structure of the partnership as compared to the FCH JU, taking due account of the specific importance of LRAs, so that it can support more demonstration projects for green

([13]) See Inception Impact Assessment, Ares(2019)4972390.

hydrogen in the EU, including in relation to the European Hydrogen Valleys Partnership. The CoR stresses that a key goal of the partnership must be to improve the exchange of knowledge and experience between the regions, between the EU institutions, the Member States and the LRAs, and between businesses;

43. encourages the Member States and LRAs, as part of their responsibility for higher education and vocational training, to promote the training of qualified professionals and scientists along the entire green hydrogen value chain. They should also set up and improve appropriate advisory services, in particular for SMEs. The CoR calls on the Commission to support such efforts, particularly in relation to the new European Pact for Skills and the European education area announced in the new Industrial Strategy for Europe ([14]);

International dimension

44. points out that, in the long term, a significant part of the demand for hydrogen/e-fuels will probably be covered by imports from regions with very good renewable resources; in this regard, imported hydrogen/e-fuels must be subject to equally strict sustainability criteria. The CoR recommends taking into account the production of hydrogen/e-fuels in third countries and transport to the EU in the requested roadmap for green hydrogen. The CoR also encourages the Commission to establish cooperation with potential export countries as well as with other import countries (e.g. Japan) at an early stage so as to support the coordinated development of an international clean hydrogen economy with a focus on green hydrogen. In addition, relevant international initiatives such as the Hydrogen Initiative under the Clean Energy Ministerial meetings and 'Mission Innovation' should be enhanced. As was the case with the European Hydrogen Valleys Partnership, LRAs should be involved here as well.

Brussels, 2 July 2020.

The President
of the European Committee of the Regions

Apostolos TZITZIKOSTAS

([14]) COM(2020) 102 final.