Hydrogen Europe

Hydrogen Europe Position Paper

Net Zero Industry Act (NZIA)

July 2023

Hydrogen Europe position paper on the Net Zero Industry Act (NZIA) legislative proposal

INTRODUCTION: IMPORTANCE OF NZIA FOR THE HYDROGEN SECTOR

The Net-Zero Industry Act[1] published by the European Commission on the 16th of March, jointly with the Critical Raw Materials Act[2] (CRMA), are key and complementary pieces of legislation for the ramp-up of hydrogen technologies' manufacturing under the Green Deal Industrial Plan. It should be instrumental to the hydrogen industry commitment of the Electrolyser Summit Joint Declaration of 5 May 2022, to develop an electrolyser manufacturing capacity of 25 GW/year as from 2025, which is required to have an installed electrolyser capacity of 90 to 100 GW able to produce 10 M tons of domestic renewable hydrogen by 2030 in line with RePowerEU. The NZIA should also help ramping-up manufacturing of fuel cells for the mobility and the buildings sectors, in line with the recent agreements on the Renewable Energy Directive III (transport subtarget of 5,5% for RNBFOs and biofuels) and the Alternative Fuels Infrastructure Regulation (minimum of one hydrogen refuelling station -HRS- each 200 km on the TEN-T core network by the end of 2030 and a HRS in every urban node), and the future Energy Performance of Buildings Directive (still under discussion). In the same way, NZIA should also support key hydrogen enabling technologies such as HRS, tanks or compressors which are crucial technologies for the ecosystem's deployment at scale.

First and foremost, the NZIA is designed to provide a response to the global clean tech manufacturing competition. Indeed, through the Inflation Reduction Act (IRA), the US is investing over USD360 Bn until 2032 (approximately EUR 330 Bn) to lay the ground for attracting manufacturing to their shores through a bonus for renewable hydrogen production and manufacturing of FC vehicles responding to local content criteria. Similarity, Japan's green transformation plans aim to raise up to JPY20 Trn through 'green transition' bonds; in addition, the country is preparing a revision of its hydrogen strategy to increase annual supply to 12 M tons by 2040 with an investment of JPY15 Trn over 15 years in the public and private sectors. Finally, Canada has proposed a "Made-In-Canada Plan for Affordable Energy, Good Jobs, and a Growing Clean Economy" based on US-like tax credits. But many countries across the globe, have also put forward investment plans forward in clean technologies or intend to do so in the coming months.

The following chart illustrates the magnitude of the challenge posed by the EU ambition to reach 10 M tons of renewable hydrogen production by 2030. An annual growth rate of 125% would be required to go from the 15 K tons produced in 2022 to 10 M tons in 2030, but a large proportion of projects in the pipeline are still in the concept phase (7.5 M tons out of the envisaged 9,7 M tons). In addition, there is a sizeable cost gap in many of the applications of renewable -and low carbon- hydrogen. A strong market and industrial policy measures are therefore needed to unlock the investments required at scale.

[1] COM(2023) 162 final
[2] COM(2023) 160 final

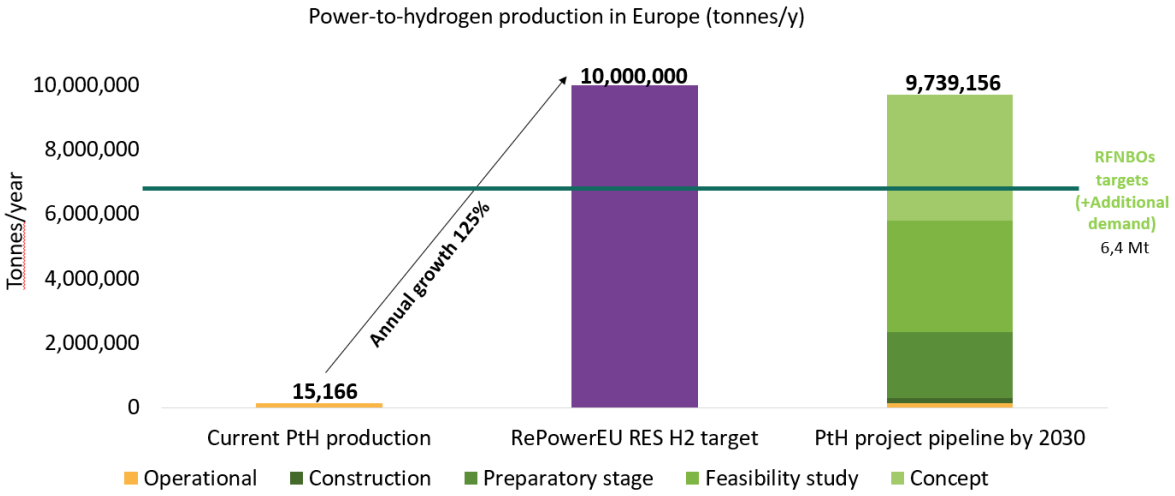


Chart 1 – Scale of the hydrogen challenge (source Hydrogen Europe)

The NZIA proposal addresses some important bottlenecks for the scale-up of hydrogen technologies and uses, via accelerated permitting procedures, facilitation of public and private financing, access to market and skills development, amongst others. In addition, electrolysers and fuel cells are recognized as being of strategic importance, thus benefitting from additional leverages such as fast track permitting, tailored investment support and the possibility of receiving public interest status at Member State level.

This proposal is welcome, but several key shortcomings need to be addressed during the legislative process for an impactful implementation. Indeed, **it will be key to make the 40% target for technologies manufacturing effective, to expand the list of net zero and strategic technologies in, as well as to identify and mobilise substantial budgetary resources**. Besides, the NZIA should be swiftly adopted, no later than April 2024. It's paramount that these NZIA weaknesses be addressed to ensure Europe fulfils its domestic hydrogen ambitions and retains its global manufacturing competitiveness.

RECOMMENDATIONS ON THE NZIA

Key recommendations:

- **Enforceable Net Zero Strategic manufacturing targets per each technology.**
- **Inclusion of RFNBOS in the NZ Strategic list with emphasis on HRS, compressors and tanks.**
- **Introduction of a target to develop at least 80 TWh of underground hydrogen storage.**
- **Meaningful funding instruments to support key hydrogen technologies and the NZIA targets by ringfencing a budget of at least EUR5.9 Bn.**
- **EU-wide minimum set of permitting requirements and alignment between manufacturing and deployment.**
- **Timely adoption of NZIA no later than Q1 2024.**

I. Enforceable Net Zero Strategic manufacturing targets per each technology

Implementation and revision of the 40% target

The establishment of a minimum 40% target for the manufacturing of annual deployment needs, underlines the EU's engagement to secure a significant production level for the European strategic technologies defined in the Annex including electrolysers and fuel cells. The target is not binding, which undermines the overall efficiency of the NZIA manufacturing mechanism. This major shortcoming should be urgently addressed by making the target effectively implementable through an enhanced and flexible monitoring system based on concrete recommendations and follow-up actions.

In addition, NZIA should also introduce the possibility to review the targets in a short time frame (e.g., every two years) to react to relevant international and domestic market developments where needed. This revision should preferably be endorsed through a quicker decision-making process than the normal co-decision procedure (e.g., delegated act by the European Commission).

Calculation of the 40% target

The calculation of the 40% target raises several questions for electrolysers and fuel cells, as well as for the other strategic net zero technologies. The regulation should therefore clarify whether it is an individual target that applies to each of the technologies listed in the Annex or if it is a cumulative target for all strategic technologies or, more restrictively, a target to be met by both electrolysers and fuel cells together.

The European Commission NZIA Staff Working Document (SWD)[3] considers that the 40% is an EU aggregated benchmark. However, a target per technology is more suited to the overall objectives of the regulation. In that case, the reference value to calculate the needed domestic production for electrolysers and fuel cells (and their key components) should be defined in the Annex, along the following lines:

- *Electrolysers*: Reference value of 25 GW per year of manufacturing ambition as from 2025 as already established in the SWD (=10 GW per year of electrolysers manufactured in the European Union).

- *Fuel cells*: In the mobility sector, the expected sales of FCEVs (4% of total market) and HDVs (25%) in 2030[4], translate into supply needs of around 45 GW of new fuel cells per year (500k fuels cells for passenger and LDV and 60k fuel cells for HDV per year). To these, one should add the fuel cells needed for forklifts, trains and light rail, maritime and inland boats, and also fuel cells for stationary applications in buildings (CHP, back-up power and gensets). Depending on market development scenarios, the total fuel cell market size in the EU by 2030 could be between 33 GW up to even 290 GW of annual fuel cells deployment.[5]

[3] *SWD(2023) 68 final*

[4] *Clean Hydrogen Joint Undertaking, "Study on impact of deployment of battery electric vehicles (BEV) and fuel cells electric vehicles (FCEV) infrastructure", 2022.*

[5] *Fuel Cells and Hydrogen 2 Joint Undertaking, Value added of the hydrogen and fuel cell sector in Europe : Supporting European growth and competitiveness : study on value chain and manufacturing competitiveness analysis for hydrogen and fuel cells technologies : summary report, Publications Office, 2019, https://data.europa.eu/doi/10.2843/065017*

Other measures applicable to strategic technologies

NZIA proposal introduces several market access measures with clear interest for industry. Among them, Hydrogen Europe welcomes the promotion of non-price criteria for public procurement of strategic technologies, consisting in a combination of sustainability and resilience marks, that EU manufacturers should be able to satisfy to a great extent. If applied appropriately, those non-price criteria could be used to favour the procurement of EU manufactured technologies within Member States, or products that embed NZIA technologies. As such, public procurement rules could be better used as a leverage to promote NZIA technologies across the value chain through the EU public procurement general framework and its specific legislation, such as the Clean Vehicles Directive.

However, these criteria should not be excessively stringent to ensure their usefulness and allow economic partners with which the EU has signed a free-trade agreement to support Europe's decarbonisation. As an example, the 65% dependency on a single source of supply within the resilience criteria may be difficult to apply to key hydrogen technologies over the next years as supplies from EU and abroad will start diversifying, even in very small percentages.

Hydrogen Europe recommendations:

1. Ensure **effective implementation** of the **target for strategic net zero technologies**, by putting into place an enhanced NZIA **monitoring system** that includes:
   (i) Adoption of recommendations on the achievement of the regulation targets by the Net Zero Europe Platform, with the support of a NZ Industry Advisory Group *(review Articles 1.2.a) and 28.3).*
   (ii) Possibility to review the targets in a shorter timeframe and through a direct procedure. Proposed wording:
      - *"By…[2 years after the date of application of this Regulation], and every 2 years thereafter until 2030, the Commission shall evaluate this Regulation, submit a report, and present, where needed, a new proposal of the regulation needed to achieve the objectives of the regulation" (review Article 35.1).*
      - *"The Commission is empowered to adopt delegated acts to amend the target applicable to strategic technologies" (add to Article 32).*
2. Confirm that the **40% target applies to each of the technologies** listed in the Annex *(review Article 1).*
3. Specify the **reference value** to which the 40% target applies to the different strategic technologies in the Annex. E.g., 40% of the 25 GW of electrolysers needed per annum and 40% of 45 GW of fuel cells needed (minimum deployment scenario in the transport sector according to Clean Hydrogen JU[6]).
4. Clarify the scope of the public procurement rules so that they refer to **standalone strategic technologies** and also promote **products that embed these** with a view to support NZIA technologies across the value chain *(add to Article 19.1).*
5. Promote the **adequate use of non-price criteria** in the NZIA regulation while avoiding too stringent resilience thresholds that would exclude its use, and preclude economic partners having signed free trade agreements with the EU from contributing to EU decarbonisation *(add to Article 19.2.d)).*

[6] *Clean Hydrogen Joint Undertaking, "Study on impact of deployment of battery electric vehicles (BEV) and fuel cells electric vehicles (FCEV) infrastructure", 2022.*

II. Inclusion of RFNBOS in the NZ Strategic list with emphasis on HRS, compressors and tanks

The range of energy technologies that are identified as Net Zero in the NZIA proposal reflects an open technological approach to the achievement of EU climate and energy objectives. Concerning the hydrogen sector, the inclusion of renewable hydrogen technologies (RNFBOS, electrolysers), the manufacturing of fuel cells for different mobility and stationary uses, and the production of alternative sustainable fuels in the list of Net Zero industry technologies (Article 3.1) is clearly an important milestone.

Definition of RFNBOs technologies and inclusion in the strategic Annex
RFNBOS technologies which are central for the development of the sector and to the achievement of the EU policy targets, are not defined in the list of Net Zero industry technologies. In Hydrogen Europe understanding, these include:

- *Hydrogen compressors*: This technology is needed across the whole hydrogen value chain from production to different end uses, especially for a well-functioning hydrogen transportation system -indispensable for compressed hydrogen transport via pipelines as well as for hydrogen liquefaction facilities and therefore a clear enabler of the hydrogen economy.

- *Hydrogen storage tanks*: Hydrogen storage is crucial for the whole hydrogen ecosystem and for the use in several hydrogen specific applications such as mobility. With hydrogen applications in mobility expected to ramp up after the implementation of AFIR as well as the revision of REPowerEU, we expect the market for high pressure storage tanks to reach several million units per year by 2030 (all storage, and especially high pressure and compressed, except large scale underground hydrogen storage).

- *Hydrogen refuelling stations*: It is the key technology between electrolysers and fuel cells in the mobility sector and their availability is central to the deployment of the hydrogen mobility ecosystem (estimates of 657 HRS minimum needed under AFIR). HRS stand out as an area of potentially high added value to the European economy -especially when the total cost and value added for the installation of the station, and not only production of the systems is included. The roll-out of hydrogen vehicles and fuel cells market growth will only happen if HRS are rolled out too, and so fuel cells cannot be supported in isolation. An integrated approach is required.[7]

If not properly addressed under the RFNBO technologies category, dependency of the above-mentioned technologies on third countries could quickly become highly critical and have adverse effects on the EU competitiveness overall. For the same reasons, Hydrogen Europe recommends that the RFNBOs technologies be added to the strategic NZIA Annex.

Finally, NZIA should also introduce the possibility to review the shortlists of hydrogen NZ/Strategic technologies based on the assessment of the Net Zero Industry Platform, and in a short time frame and quicker decision-making process -as requested for the strategic technologies targets- (e.g., every two years, delegated act by the European Commission) to react to market conditions and include the technologies expected to develop in the coming years (e.g., liquid hydrogen pumps and tanks, turbines, hydrogen internal combustion engines…).

[7] *Fuel Cells and Hydrogen 2 Joint Undertaking, Value added of the hydrogen and fuel cell sector in Europe : Supporting European growth and competitiveness : study on value chain and manufacturing competitiveness analysis for hydrogen and fuel cells technologies : summary report, Publications Office, 2019, https://data.europa.eu/doi/10.2843/065017*

Easier access for RFNBOs technologies to strategic project status

For the strategic technologies to get access to the additional benefits outlined in the proposal (shorter permitting processes, more tailored support for funding and finance, specific public procurement procedures and public interest status), manufacturing projects need in general to be qualified first as strategic following an application process. The approach of Article 10.4 to provide a quasi-automatic strategic project status to the manufacturing of strategic technologies that benefit from the ETS Innovation Fund or the Hydrogen Bank, are part of Important Projects of Common European Interest or of European Hydrogen Valleys acknowledges the need to give a special treatment to hydrogen projects. However, the reference to the European Hydrogen Valleys and the H2 Bank may be confusing as they do not involve specific support to manufacturing of hydrogen technologies. Whereas it will be important to further support hydrogen technology manufacturing projects through the IF and IPCEIs, the NZIA differentiated approach may create uncertainty for other strategic projects and uneven treatment across the European Union. NZIA should rather presume that all projects relating to the strategic technologies included in the Annex meet the criteria defined in Article 10.1 (contribution to EU energy resilience and positive impact on the EU supply chain or downstream sectors) and are, automatically, strategic.

Products covered – links to other EU initiatives

NZIA should also ensure that all products needed to manufacture the identified Net Zero technologies are duly supported in a supply chain perspective, with a specific focus on processed materials and critical raw materials.

- *Processed materials:*

  -*NZIA coverage of processed materials if not ensured by the CRMA*: Following its Article 3.1, NZIA covers final products, specific components and specific machinery primarily used to produce those products, that meet a TRL of at least 8. In a supply chain perspective it should also include "processed materials" so as to encompass key materials needed for hydrogen technologies, such as fluoropolymers and ionomers and other high-performance materials that are used in technologies across the value chain, from hydrogen production, to infrastructure, storage, and mobility. The objective is to avoid potential disruptions that could put the overall manufacturing efforts at risk. If these materials are not duly covered there could potential disruptions and put the overall manufacturing efforts at risk.

  -*Coherent approach for per- and polyfluoroalkyl substances (PFAS):* NZIA should also ensure that the regulatory framework for substances needed to manufacture the Net Zero and strategic hydrogen technologies will not become an obstacle for NZIA implementation, and guarantee a dedicated follow of this issue under the Net Zero Energy Platform.
  In this respect, Hydrogen Europe would like to draw attention to the current EU-wide restriction process on PFAS. This broad category of chemicals includes fluoropolymers, which are extensively used in electrolysers and fuel cell technologies and all across the hydrogen value chain from production, infrastructure (e.g., in grids technologies and HRS) and storage to end use. Those fluoropolymers are particularly used in (proton exchange) membranes, and also in gaskets and sealings. For example, close to 1750 tons of fluoropolymers would be needed just for membrane production to meet the REPowerEU objective of 10 M tons of renewable hydrogen production (i.e. ca 140 GW of electrolyser capacity). Their inclusion under the PFAS-wide ban, based on their persistency and their lifecycle emissions, is ill-guided as the former is required in the product and the latter can (and should) be addressed by binding emissions monitoring and abatement measures. Fluoropolymers also meet OECD criteria of "polymers of low concern". Additionally, no alternatives are foreseen that could reach the necessary KPIs for the ramp-up of the hydrogen

industry in the near future. Due to their unique chemical and physical properties, fluoropolymers are key for the nascent hydrogen sector which calls for an indefinite exemption for fluoropolymers as part of the proposed EU-wide PFAS ban - as opposed to a 5-year derogation for fluoropolymer use only in PEM fuel cells as it's currently foreseen.

- *Critical Raw Materials (CRMs):*
  The twin CRMA proposal of NZIA puts forward a common EU strategy and legal framework on CRMs, and creates thereby the first building block towards the deployment of clean technologies. Electrolysers and fuels cells, identified as strategic within the NZIA proposal, and other key technologies, require CRMs for some of their main components, especially PGMs (platinum group metals) and other more common materials (Nickel, Copper, etc.). These are at high risk for supply disruptions due to high prices, unique extraction locations, or competition with other technologies. Hence, a correct representation of those critical CRMs for hydrogen technologies should be ensured in the CRMA, to guarantee effective implementation of the NZIA regulation in general and the achievement of the 40% target applied to strategic technologies in particular. Even if NZIA does not cover CRMs *per se*, the final proposal should state clearly the criticality of those materials and establish a direct link between both pieces of legislation.

Hydrogen Europe recommendations:

6. Refine the **RFNBOs Net Zero technologies** category by including a definition that explicitly spells out hydrogen refuelling stations, compressors and hydrogen storage tanks (*add definition in Article 3.1*)
7. Expand the list of **strategic NZ technologies** to the following NZ technologies: (*review Annex*)
   - Add **RFNBOs** following the scope defined in Article 3.1 (hydrogen compressors, high pressure and cryogenic tanks and hydrogen refuelling stations).
   - Add **U to CCS***:* relevant for efuels and carbon based hydrogen derivatives synthesis, with the focus being put on new technologies for CO2 applications.
8. Include the possibility to **review the list of NZ and strategic technologies** to react to market conditions and include the technologies expected to develop in the coming years, in a shorter timeframe (2 years) and through a direct procedure (delegated act), in the same way as recommendation 1.b *(add to Article 32, and review Article 35.1).*
9. Automatically **qualify all projects** relating to the strategic technologies of the Annex **as strategic** projects, so that they can benefit from the specific provisions established by the regulation (*review Article 10.4*).
10. Add "**processed materials for hydrogen technologies**" to the list of products that are covered by NZIA and include a definition in the regulation *(add to Article 3.1).*
11. Support an indefinite **exemption for the production and use of fluoropolymers as part of the proposed EU-wide PFAS ban,** in opposition to the 5-year derogation for fluoropolymer use only in PEM fuel cells, due to their unique chemical and physical properties and their key enabling role across the whole nascent hydrogen sector (*add to Recital 11*).
12. State clearly the **criticality of CRMs** for the deployment of Net Zero technologies and the achievement of the 40% target for hydrogen strategic technologies, as they may lead to major disruptions, and acknowledge the geographical dependency on limited regions of the world, due to geology, for the supply of those CRMs, particularly PGMs (*add to Recital 11 point on NZIA-CRM synergies*).
13. From a larger perspective, the NZIA should reflect a time-to-decarbonisation approach concerning the technologies needed to fasten the race towards climate neutrality, with a focus on the challenges relating to their technical components. In the context of climate emergency, decarbonisation is extremely important. Therefore, all technological pathways that can help

accelerate decarbonisation towards the 2050 net zero objective, such as emission reduction, net zero, carbon negative and circular technologies should be taken into consideration *(add in Recital 9).*

III. Hydrogen and CO2 storage capacity

Common storage challenges

While the main purpose of NZIA is to simplify the regulatory framework for the manufacturing of technologies that support the clean energy transition, we welcome the attempt to also include measures aimed at accelerating the capacity to store CO2 emissions within Chapter III of the regulation.

Alongside the CO2 storage capacity, development of large-scale underground hydrogen storage will be crucial and equally challenging. The significant deployment of hydrogen and derivatives foreseen in the European Commission's Hydrogen Strategy (later updated by REPowerEU) will require the deployment of various forms of hydrogen storage for several reasons, among which to match hydrogen supply and demand profiles, driven by the intermittency of renewable energy sources, facilitating the use of hydrogen in industry, transport and eventually power generation. .[8] As natural gas is gradually phased out from use in the heating sector, large-scale hydrogen storage will be indispensable for enabling seasonal storage of renewable energy and ensuring security of energy supply during winter.

There are numerous system-wide benefits to hydrogen storage – both from the point of view of the power sector as well as the hydrogen sector itself, contributing to the security of supply, system flexibility and system stability. At the same time there are also numerous barriers slowing down their development in the EU – also including regulatory barriers.

Inclusion of a hydrogen storage target to meet the sector's needs

The current energy sector planning does not facilitate proper evaluation of the future storage needs and benefits – especially with respect to sector coupling and its impacts, which may result in unnecessary investment in electricity or natural gas networks. The current energy markets design and network tariffs also do not properly reward the benefits of hydrogen storage holding up investments. Other potential barriers might occur as a result of implementation of the planned unbundling rules creating regulatory uncertainty impacting the decisions for constructing new hydrogen storage facilities and conversion of existing natural gas storages.

As the time to develop new large scale, underground storage installations (or conversion of natural gas ones) can take from 3 to even 10 years, it is of utmost importance for NZIA to also include hydrogen storage capacity in its scope – in a similar manner to CO2 storage capacity developments. According to a first order estimate by Gas Infrastructure Europe (GIE), applying a storage to demand ratio of 24% (comparable to the storage-to-demand ratio for natural gas in the EU)[9].

The targeted renewable hydrogen consumption target of 20 M t envisaged by RePowerEU, would translate in the need for around 160 TWh of hydrogen storage in 2030. Considering however that the

[8] *European Commission, Directorate-General for Energy, Breitschopf, B., Zheng, L., Plaisir, M.et al., The role of renewable H_2 import & storage to scale up the EU deployment of renewable H_2 – Report, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2833/727785*

[9] *Gas Infrastructure Europe, Picturing the value of underground gas storage to the European hydrogen system, June 2021.*

storage of the 10 Mt of hydrogen imported from outside of the EU will, to a large extent, take place through import terminals, Hydrogen Europe suggests setting an underground storage target for 2030 at around 80 TWh, requiring a total CAPEX of around €16 Bn.

Clarification of the CO2 injection ambition

The usage of expression "annual injection capacity" in Article 3 and throughout the Chapter III might create a certain degree of ambiguity, as it creates the impression that from 2030 onwards, injection capacity of 50 Mt should be provided every year and that it refers only to actual injection capacity instead of the storage's working volume, which seems to be legislator's objective.

In order to make it clear that the EU CO2 storage target of 50 MT is meant and defined solely for 2030 - without any provisions for further years, the word "annual" should be removed and storage (instead of injection) shall be used (an annual injection storage capacity).

Hydrogen Europe recommendations :

14. Extend Chapter III to **hydrogen storage** and introduce an **additional target to develop at least 80 TWh of underground hydrogen storage** capacity in the EU by 2030, requiring a total CAPEX of around €16 Bn (*complete title of Chapter III, and add new paragraph in Article 16).*
15. Change the target related to CO2 storage from "50 Mt annual injection capacity" to "**50 Mt of storage capacity**" *(review Article 16).*

IV. Meaningful funding instruments to reach NZIA targets to support hydrogen technologies

Despite the NZIA provisions aiming at facilitating funding and financing for the Net Zero manufacturing projects, the reality is that the NZIA proposal lacks funding and financing leverages to support the industrialisation of net zero and strategic technologies. This major shortcoming risks jeopardizing the objectives of the NZIA altogether and the EU's industrial competitiveness in particular.

Investment and funding needs

The investment needs for hydrogen technologies (electrolysers, fuel cells and other enabling technologies) have been underestimated in the European Commission SWD accompanying the NZIA proposal, compared to the other strategic technologies assessed:

- Hydrogen Europe evaluates the investments needs to deploy 25 GW of manufacturing capacity of electrolysers at **EUR4.7 Bn** (based on the assumption of an average cost of EUR200 M per 1 GW, vs EUR60 M in the European Commission SWD, and the 2,3 GW already existing in Europe). With NZIA benchmark of 40%, that amounts to 10 GW of manufacturing capacity, increasing manufacturing capacity by at least **7,7 GW** would require **EUR1,5 Bn**.
- Concerning fuel cells, Hydrogen Europe evaluates investments needs to deploy 45 GW of fuel cells needed yearly for LDV and HDV at **EUR4.5-9 Bn.** With NZIA benchmark of 40%, increasing fuel cell manufacturing capacity by at least **18 GW** would require **EUR1.8-3.6 Bn**.
- In addition, other important investments would be simultaneously needed for other key RFNBO technologies such as hydrogen refuelling stations, compressors, and tanks. While its extremely difficult to estimate the costs of deploying new manufacturing capacities[10], the

[10] *The difficulties are related to the fact that it is hard to estimate the existing manufacturing capacities as well as due to a sizeable overlap between those elements (compressors and H2 storage tanks are a significant part of HRS production costs).*

deployment of the ~660 HRS required by AFIR would demand investments of around EUR2.6 Bn.

In addition, funding rates applied in the NZIA SWD of 17-20% are too low and should be aligned with existing CAPEX funding rates at EU level for manufacturing, such as the 60% funding benchmark established within the ETS-Innovation Fund.

Technology	Annual technology deployment in 2030	Current installed EU manufacturing capacity*	Share of EU production in EU demand	EU manufacturing capacity in 2030	New manufacturing capacity needed	Factory CAPEX (M€/unit/year)	Manufacturing capacity investment needs (Bn EUR)	40% target investment needs (Bn EUR)	Funding rate in Bn EUR (60%)
ELYS (HE estimates)	25	2,3	100%	25	22,7	200	**4.7**	**1,5**	**0,9**
ELYS (EC SWD)	25	2.3	100%	25	22	60	1.332	-	-
FC* (HE estimates)	45		100%	45		200	**4,5-9**	**1,8-3,6**	**(1,08-2,16)**
FC (EC)	-	-	-	-	-	-	-	-	-
RFNBOS TECHNOLOGIES (HRS, compressors, tanks)	-	-	-	-	-	-	-	-	2.4

*(*to be completed with fuel cell needs for forklifts, trains and light rail, maritime and inland boats, and buildings -CHP, back-up power and gensets).*

In light of the above, the European Commission should undertake a proper assessment of the investment and funding needs related to the NZIA technologies and the strategic technologies benchmark.

Significant funding instruments

Against the very concrete needs identified in the previous table, NZIA proposes to inform manufacturing project promoters of existing opportunities and to mobilise public stakeholders. These proposals are a good starting point but will not solve the fact that there is no specific budget to make the NZIA proposal effective. This question should therefore be urgently addressed by, for example:

- Mobilising the EUR100 Bn Next Generation loans not used by Member States and unappropriated EU funds.
- Setting up the new Sovereign Fund funding instruments with a dedicated budget line for Hydrogen technology manufacturing.
- Strengthening the electrolysers/fuel cells manufacturing support under the ETS-Innovation fund.

EU funding and state aid alignment

In parallel, to allow Member States to adequately support hydrogen technologies manufacturing projects, it would be necessary to ensure consistency between the NZIA and the recently updated state aid framework. The State Aid Temporary Crisis and Transition Framework (TCTF) allows Member States to fund the manufacturing of key technologies between 15% and 50% of the investment costs (and max. EUR150 M-EUR250 M) until end 2025, but only for electrolysers; fuel cells and other hydrogen technologies are thus excluded and need to be incorporated. In addition, neither the Global Block Exemption Regulation (GBER) nor the State Aid Framework for Climate, Energy and Environment

allow state aid for the manufacturing of technologies, and should be reviewed to align with NZIA ambitions. Finally, it should be possible to complement the EU funds with state aid for adequate coverage of the manufacturing funding gap and achievement of bigger impact.

Hydrogen Europe recommendations:

16. **Make a proper assessment of the investment and funding needs** related to the NZIA technologies and the strategic technologies benchmark, while taking into consideration the industry estimates (e.g., ELYS: EUR1,5 Bn investments/EUR0,9 Bn funding; FC: EUR1,8-3,6 Bn investments/(EUR1,08-2,16 Bn funding…) *(new Article 14.bis).*

17. Urgently **identify funds** to support NZIA implementation (*new Article 14.bis).*
    - Mobilisation of EUR100 Bn loans not used by Member States and unappropriated EU funds.
    - Setting up the new Sovereign Fund funding instruments with a dedicated budget line for Hydrogen technology manufacturing
    - Strengthening the electrolysers/fuel cells manufacturing support under the ETS-Innovation fund.

18. Review the **TCTF to allow state aid** for the manufacturing of all technologies identified in the **NZIA**, and develop a similar funding opportunity under GBER/CEEAG after the end of the TCTF. This review should also make possible to complement the EU funds with state aid for adequate coverage of the manufacturing funding gap. In addition, introduce a reference to the follow up of these specific provisions in NZIA *(new Article 14.bis and Section2.8 of the TCTF).*

19. Ensure level playing field with **responsible manufacturing and consideration of minimum sustainability criteria along the complete supply chain** *(new Article 14.bis).* NZIA public procurement sustainability rules should also build on these criteria accordingly *(review Article 19.2.a)).*

V. EU-wide minimum set of permitting requirements and alignment between manufacturing and deployment

Two of the most relevant contributions of the NZIA proposal are the introduction of mandatory accelerated permitting processes for Net Zero technologies projects (with an additional fast track for strategic technologies) and the designation of a national authority in all Member States to coordinate the submission of all the documents for the permit granting process, encompassing a facilitating role for the needed environmental impacts assessments. Ensuring effective implementation of these provisions should be clearly in the remit of the Net Zero Europe Platform.

Minimum permitting requirements

Reducing and harmonising the permitting timelines to 9-12 months for electrolysers and fuel cells manufacturing, depending on the size of the project, is indeed an important step forward. On average, between 1,5 and 2 years may be needed to obtain the needed permitting processes, though these could be shorter or longer depending on the national and local regulations and administrative requirements where the factory is located, that will determine the amount, type and length of permits depending on the type of operation -new vs extension-, the size of factory and other relevant factors. But the NZIA proposal could be more ambitious and intervene in the permitting procedures themselves. NZIA is indeed an opportunity to facilitate the alignment of different regulations and administrative permitting practices by defining a minimum set of requirements to be respected by Member states. This would simplify the preparatory work for promoters submitting manufacturing projects, while facilitating the instruction of requests by administrations. In addition, permitting could

be further improved through a single online information platform giving access to Members states requirements, and developed by the NZ Energy Platform.

Impact of public interest projects

Hydrogen Europe also expects that the possibility to give public interest status to strategic projects will facilitate the permitting procedures and help them to meet the permitting timelines. This should allow them to override other interests provided that EU legislation on environmental impacts is respected. However, the recognition of this status is rather uncertain as it depends on the Member States' existing framework and lacks level playing field. It would therefore be useful to provide guidelines on the recommended criteria and use for more transparency and impact.

Align permitting timelines and remove burdensome requirements

The manufacturing of NZIA technologies depends also on the permitting processes of hydrogen deployment projects. Indeed, hydrogen project deployment creates the demand for NZIA technologies, thus hydrogen deployment projects should at least be governed by the same 12-18 months permitting timelines established for NZ technologies. In addition, burdensome requirements and red tape that apply to other parts of the hydrogen value chain and slow down the uptake of NZ technologies should be urgently assessed and removed. A key example at EU level is that of the Industrial Emissions Directive where the Council has recently proposed to exclude electrolysis-based hydrogen production technologies, on grounds that it does not produce emissions, but only for plants below 60 tons per day, even though the emissions profile is not affected by size.

Hydrogen Europe recommendations:

20. Define a **minimum set of permitting requirements** to be respected by Member States *(new Article 6 bis).*

21. Put into place a **single online information platform**, developed by the NZ Europe Platform, to provide access to Members states requirements *(new Article 5.2).*

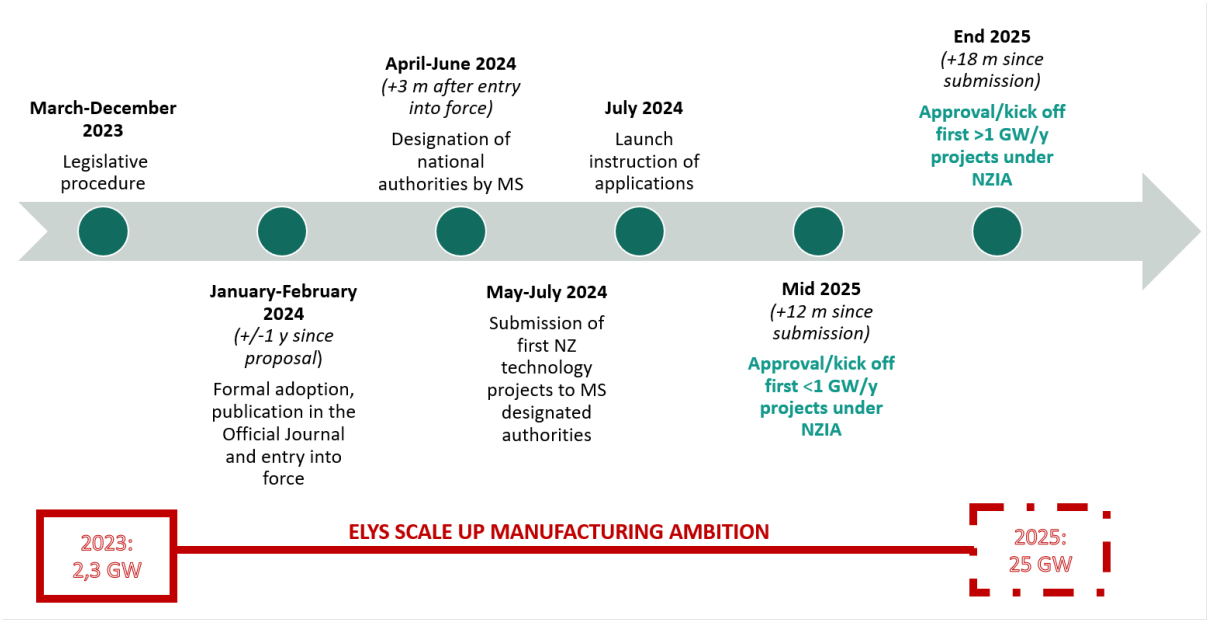
22. Provide guidance at EU level on the **public interest status** for more transparency and certainty in Member States *(add to Article 12.2*).

23. Urgently **remove burdensome requirements and red tape**, such as hydrogen's inclusion in the **Industrial Emissions Directive** (*add to Article 4.8*).
24. Ensure effective implementation of permitting timelines*,* by putting into place an enhanced NZIA **monitoring system** like the one described in Recommendation no 1, that includes recommendations by the Net Zero Europe Platform and a flexible revision of permitting provisions *(add to Articles 28.3, 35.1 and 32).*

VI. Timely adoption of NZIA no later than Q1 2024

Hydrogen Europe understands that there is a mismatch between the immediate manufacturing needs in the hydrogen sector and the first effects of the regulation that are expected by 2025 at the earliest. This could, as an example, heavily compromise the achievement of the reference number of 25 GW of ELYs production capacity by 2025, and subsequent deployments in the hydrogen value chain.

In the best-case scenario, the first manufacturing projects approved and supported under the new NZIA will be launched mid/end of 2025, as shown in the following table. And the situation could become even more critical if the NZIA decision-making process lasts even longer.



Against this background, swift adoption and entry into force of the NZIA no later than Q1 2024, will be of utmost importance. Member states are also invited to urgently consider, with the support of the European Commission, and early application of some of NZIA's key proposals such as the accelerated permitting processes.

Hydrogen Europe recommendations:

25. Ensure **quick adoption and entry into force** of the regulation, no later than Q1 2024.
26. Invite Member States to launch a coordination process under the Council WG-Competitiveness and Growth, with the support of the European Commission, to exchange on existing best practices (e.g., accelerated permitting processes, one-stop-shops) and to align on **anticipated application** of some NZIA's proposals that are essential to support the manufacturing of clean techs, with a focus on permitting timelines *(new Recital 10 bis).*

VII. Inclusion of industry in NZIA Governance structure

The establishment of the Net Zero Europe Platform governance structure under the NZIA is a key development to guarantee the implementation of the regulation. However, only European Commission and Member states participation is foreseen at this point. This situation should be remediated through the creation of an industry advisory group where trade associations representing the NZ technologies industry could share their expertise and views on the NZIA vision and developments.

Another key point that should be clarified, is how the NZ Europe Platform will coordinate and work with the European industrial alliances and the envisaged NZ Industrial Partnerships with third countries towards meeting the objectives of NZIA without duplicating the work. The NZIA refers, for instance, to the European Clean Hydrogen Alliance, and to the Electrolysers Partnership, but without providing any detailed guidance. The Renewable and Low Carbon Fuels Alliance, which is not mentioned, should also be recognised as being relevant in the light of the NZ technologies identified, and called to interact with the Platform.

Hydrogen Europe recommendations:

27. Set up an **NZ Industry Advisory Group** that will work with the NZ Europe Platform to provide expertise on the NZIA strategic approach and implementation *(review Article 29.8).*
28. Ensure **smooth coordination** between the NZ Europe Platform and the ELYs Partnership, the European Clean Hydrogen Alliance, the Renewables and Low carbon Fuels Alliance and the upcoming NZ Industrial Partnerships (*add new paragraph in Article 28.4 bis*).

VIII. Coordination of skills initiatives and funding support

The development of the needed skills for NZIA technologies manufacturing via the Net Zero Industry Academies is another welcome proposal. However, there is a risk of duplication of these with the existing initiatives (e.g., blueprints, pact for skills…). This should particularly be avoided in the hydrogen sector which has already the Erasmus+ project 'GreenSkillsforH2' and the Hydrogen Academic network project funded by the Clean Hydrogen Partnership to lay the foundations for academic, vocational education, and continuous professional development. It is thus important that any NZIA initiative on hydrogen skills integrates past projects, builds on the sector's expertise, and mobilizes new funds for the completion of the hydrogen skills strategy and roadmap.

Finally, particular attention should also be given to attracting skilled workers and avoiding brain drain in favour of other global competitors. Though EU competencies are limited in this area, the NZ Energy Platform is a clear opportunity to raise awareness on the risks and provide guidance on the policies needed (e.g., working conditions, taxation…) to support Member states labour needs.

Hydrogen Europe recommendations:

29. Create a **dedicated Hydrogen NZIA Skills Academy** backed by the **adequate funding** to support 300K new jobs in the hydrogen sector *(add to Recital 66).*
30. Build the NZIA Skills Academy on hydrogen on **existing initiatives and projects** (the Erasmus + project, GreenSkillsforH2, and the upcoming Hydrogen Academic Network) as well as the European Hydrogen Observatory training and materials section. The Skills Academy on hydrogen should support the continuity of these initiatives, while helping address their gaps and providing complementarities *(add new paragraph 2 in Article 23).*
31. Build the NZIA Skills Academy on hydrogen with the **expertise of relevant sectoral partners** with a view to (*add new paragraph 3 in Article 23):*
    - make available accredited learning programmes and materials to train, upskill and reskill students and workers,
    - promote the attractivity and the career opportunities of net zero industries.
32. The Net Zero Europe Platform work on skills should **not add an extra layer** to the existing skills **governance structures** (*add to Article 25 (2)).*
33. Enlarge mandate of the NZ Energy Platform to raise awareness and provide guidance at EU level on **brain drain risks and countermeasures** (*add to Article 25 (2)).*

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