

FROM AMBITION TO REALITY 3

Steps to accelerate net zero delivery

Executive summary

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A compelling case for change

This is the third installment of the From Ambition to Reality (FATR) series, a collaboration between Worley and Princeton University's Andlinger Center for Energy and the Environment. The series moves the net zero narrative from what is needed, to how we meet this immense infrastructure delivery challenge. We assert that it will not be achieved through a traditional project delivery approach.

A radical new paradigm is needed, one which will build the durable, responsible, and pragmatic means of achieving the seemingly impossible. Our previous work identifies five key shifts (FATR shifts) in infrastructure delivery practices we believe are needed, and indicates a large gap between practices of today, and what is required by 2030.

This paper builds detail into our framework and proposes key initiatives that can be applied to any low-carbon sector or supply chain to drive the changes required. It examines in detail a clean energy value chain ambition that has strong policy direction and decarbonization potential – renewable hydrogen in the European Union (EU).

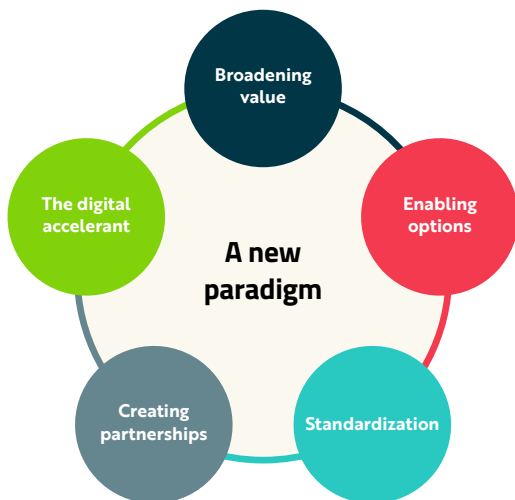


FIGURE 1 The FATR shifts

A spotlight on hydrogen in the EU

Our analysis shows that the EU ambition of 10 million tons per annum (MTPA) of renewable hydrogen by 2030 would require the delivery of 500 projects of equivalent size to the largest such project to achieve financial close in Europe to date.

On this basis, we assert that a smaller number of much larger mega-projects will be needed. We define a Base Hydrogen Project (shown in Figure 2), of which 25 would need to be operational by 2030 to achieve the stated EU ambition.

Such a mega-project would take 8 to 10 years to deliver using conventional project delivery approaches, thereby putting the EU policy ambition at direct risk.

Strongly influencing this timeframe is the process by which capital flows into projects, termed capital discipline. This staged, disciplined decision-making process weighs risks and uncertainties of many kinds, from technological to social, political, regulatory, and bottlenecks in materials and labor. This is a critical process to avoid failed investments. However, in the context of a complex energy transition and the pace at which it needs to move, conventional approaches are slowing down decision-making, the flow of capital and infrastructure delivery.

What can be done to support acceleration of the investment process to drive the hydrogen industry to where it needs to be, while maintaining capital discipline?

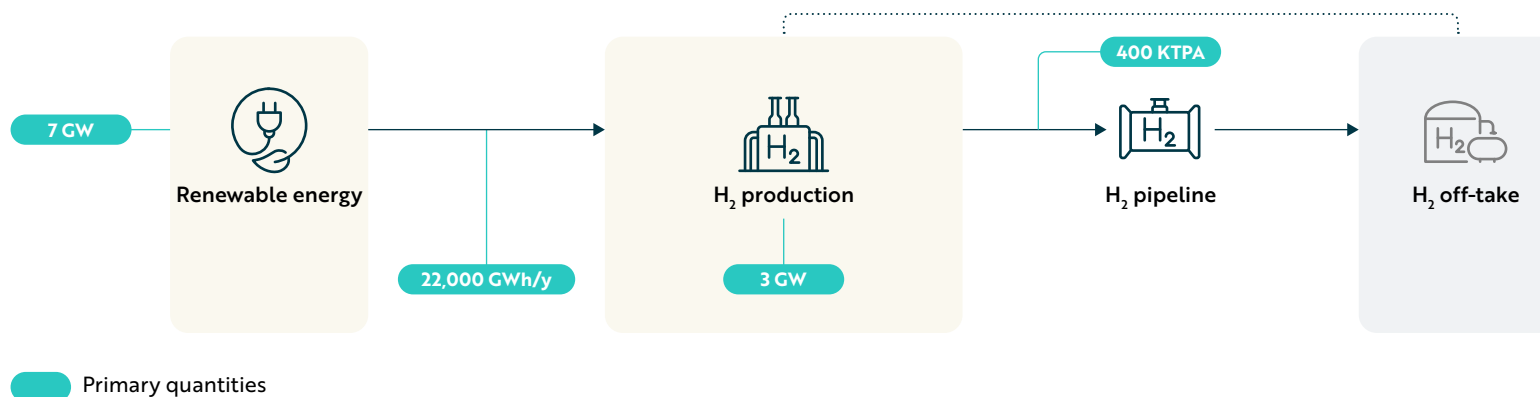


FIGURE 2 The simple view of our Base Hydrogen Project.

Overcoming barriers to achieving net zero ambitions

The barriers to faster capital deployment in hydrogen can be categorized into three domains:

Certainty

Overcoming the risk of investment

Acceptance

Building an acceptable social, commercial and political contract

Productivity

Getting the pace of deployment to what is needed

We propose an **EU Renewable H₂ Plan** based on the application of our FATR shifts, consisting of specific initiatives to help overcome these barriers and drive the hydrogen industry faster. Our modeling indicates this could compress the delivery timeline of such projects by around 40%. Importantly, this significant project delivery acceleration could be achieved while maintaining capital discipline.

The FATR shifts can significantly accelerate decarbonization deployment. However, achieving the ambitious EU renewable hydrogen policy remains a challenge because the paradigm change in delivery practice, and the EU Renewable H₂ Plan, will require time to implement. There is also likely to be fierce competition for renewable energy supply from the broader EU economy.

From regional initiatives to global steps

A thriving hydrogen industry is just one component of the net zero infrastructure puzzle.

Globalizing our thinking to be applicable across other technologies and low carbon value chains, we adapted five of the EU Renewable H₂ Plan initiatives to create the **2024 FATR Plan**, which outlines five initiatives for implementation in 2024. The initiatives in the 2024 FATR Plan can be applied to any low carbon sector or supply chain to drive significant momentum towards adoption of the shifts by 2030. Figure 3 shows the 2024 FATR Plan initiatives and our view of responsible parties.

Infrastructure participant role:	2024 FATR Plan				
	1 Facilitate transparency and information sharing	2 Build leading practice guidelines	3 Establish consistent terminology and narratives	4 Expedite the workforce needed	5 Convene coalitions for standardization
★ Lead(s)					
⚡ Key support					
💬 Consulted					
Asset owners and project developers	★	★	★	⚡	★
Banks and investors	⚡	💬	⚡	💬	💬
EPC services and contractors	⚡	★	★	★	★
Supply chain providers	💬	💬	💬	⚡	💬
Equipment manufacturers	💬	💬	⚡	⚡	★
Policymakers and regulators	★	⚡	💬	★	⚡
Communities, social and environmental NGOs	💬	⚡	💬	💬	💬
Educators, universities and researchers	⚡	💬	⚡	★	⚡
Labor organizations	💬	⚡	💬	⚡	💬
Target implementation year	All FATR initiatives in 2024				

FIGURE 3 The 2024 FATR Plan highlighting the participants responsible.

Our challenge to infrastructure participants to accelerate delivery

The changes to project delivery practices we propose are radical but responsible. The unprecedented nature of achieving mid-century net zero requires the radical, and this paper demonstrates how such changes can be applied while maintaining the essential discipline on the extraordinary capital investment needed.

We **must** change our paradigm and adopt the new delivery practices as standard by 2030, but we have a long way to go. The inaugural 2023 Princeton Net Zero Stakeholder Survey provides the first quantitative assessment of FATR shift implementation. Figure 4 incorporates those results and the 2024 FATR plan as part of a complete update to our FATR Framework, showing the implementation gap from where we were, are currently, and the steps that need to be taken in 2024 to get to where we need to be.

Our collective focus must move from **what** we need to do, to **how** we're going to do it, and central to this is **who** is going to take the lead.

All of those involved in delivering net zero infrastructure – the “infrastructure participants” of the world – have essential roles. Governments, in particular, must take the lead on critical levers including enabling infrastructure, rewarding innovation, providing certainty on the revenue and supply sides, and facilitating the essential social dialogue.

We call on all industry participants to consider their roles, to join with us, and make the essential changes.

Achieving net zero is possible. However, the enormity of the task requires us to do things differently. It was the Princeton scientist, Albert Einstein who said, “*We cannot solve our problems with the same thinking we used when we created them.*” What steps will you take?

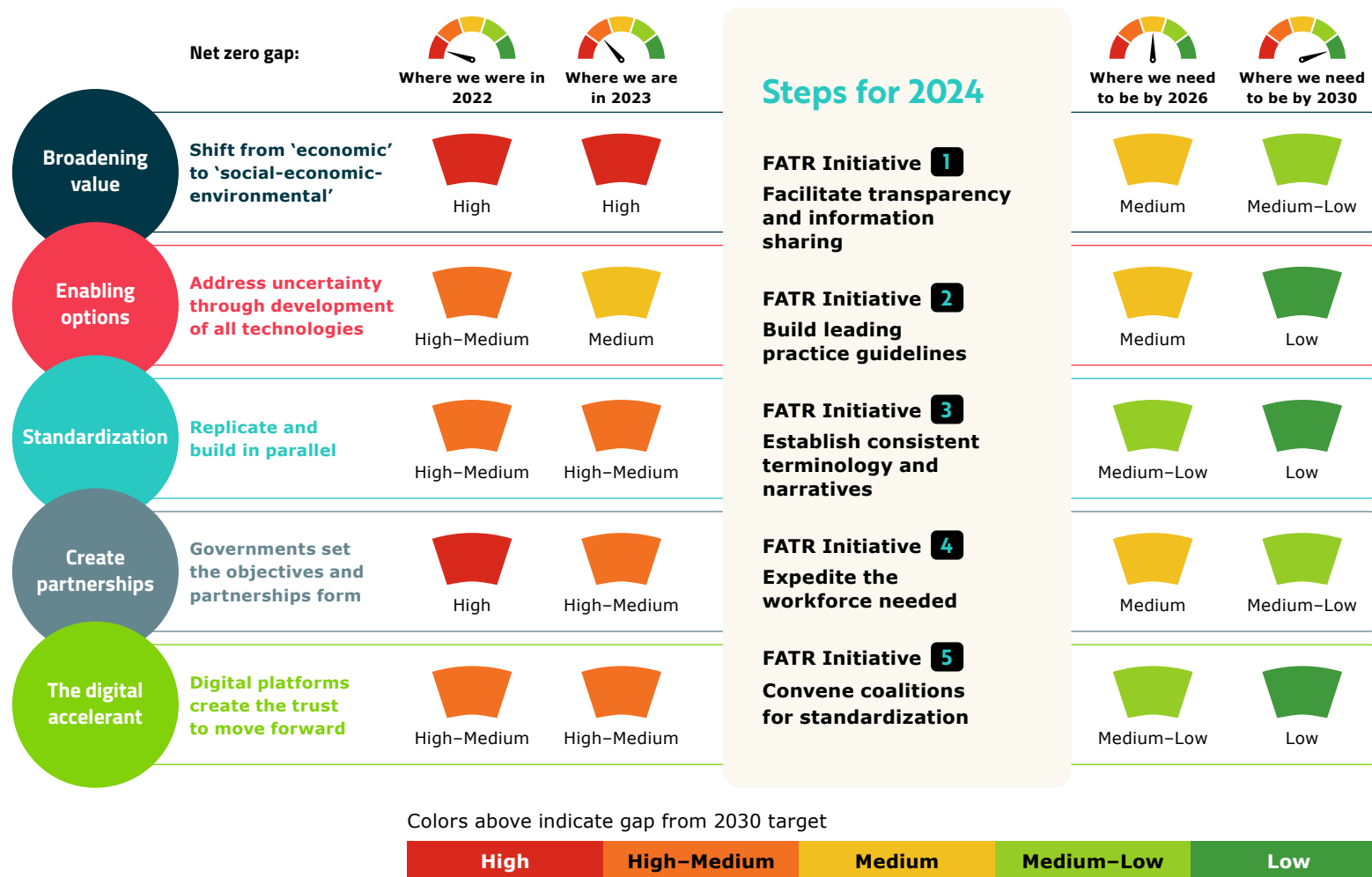


FIGURE 4 Our updated FATR Framework showing the shift implementation pathway to 2030.

Thank you for taking a step towards accelerating net zero delivery.

For the full version of this paper and to revisit previous papers, follow this link:

[From Ambition to Reality](#)

