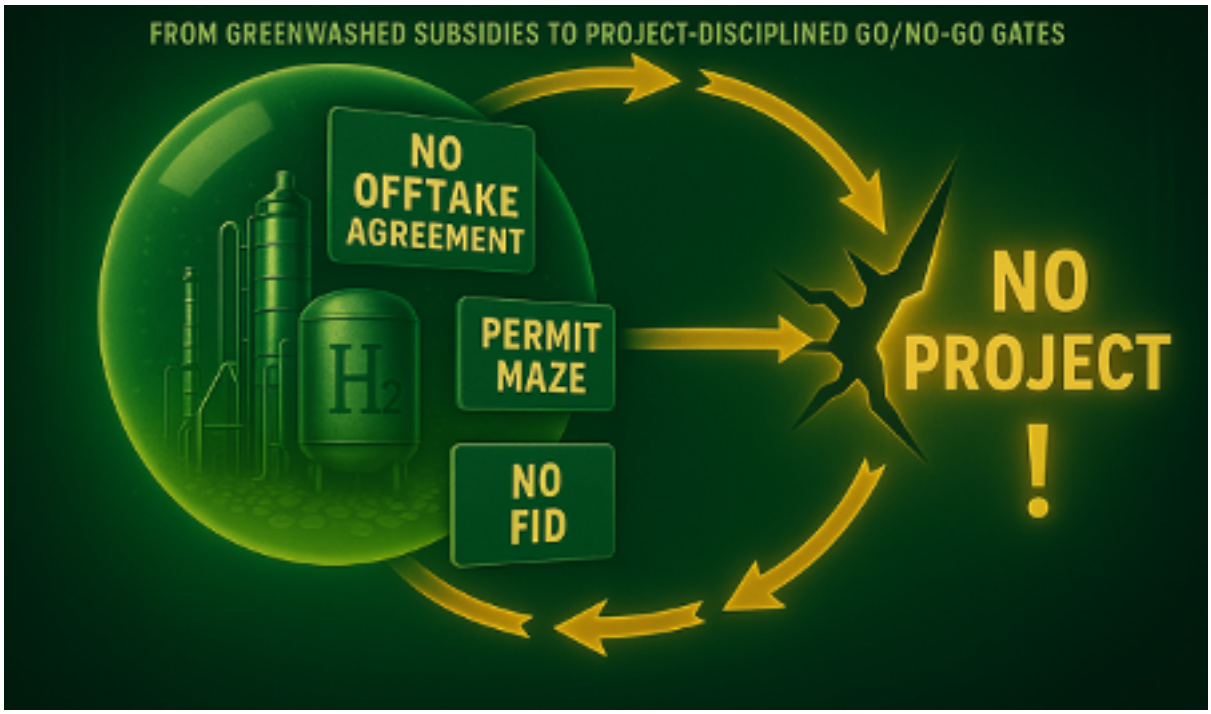
ESCAPE THE HYDROGEN BUBBLE BUBBLE



This article follows on from my earlier posts, *"**The Colour of the Hydrogen Virus is Green**"* and *"**Project Management Simplified**."* Industries and corporations must ask themselves, when evaluating subsidies for any green hydrogen initiative: **"What can we control actively vs What lies beyond our influence?"**

While political environments and subsidy frameworks often shift and remain outside corporate control, **project management discipline** is firmly within reach. Embedding structured project management into green hydrogen projects particularly through **Gate Review processes** dramatically improves the odds of success. A Gate Review process is a systematic approach where a project is assessed at defined checkpoints (or "gates") to determine whether it is ready to proceed to the next stage based on predefined criteria such as technical feasibility, strategic alignment, and risk exposure.

Gate Reviews provide a standardized, objective methodology to evaluate whether a project is genuinely ready to proceed. If an organisation lacks the internal competence for such governance, these capabilities can and should be sourced from experienced engineering firms or project management offices (PMOs). Failing to do so can result in missed risks, poor decision-making, and significant delays or cost overruns that might otherwise be avoidable. Moreover, identifying risks proactively and evaluating readiness at each gate minimizes setbacks and reduces wasted effort.

So what are the gates? And what must be asked at each one?

Gate A - Scope & Strategic Alignment

Essential Question:

Are we solving a real industry need or just chasing policy trends?

- What specific problem does this project address?
- Is there a clear alignment with long-term business objectives?
- Is this initiative rooted in demand or subsidy-driven speculation?
- Do we have scope clarity and measurable objectives?

Gate B -Commercial Viability & Long-Term Commitment

Essential Question:

Do we have a business case?

- Do we have confirmed long-term offtake agreements or are we in negotiations with identified clients / off-takers?
- Do we have already a working estimated number for CAPEX & OPEX?
- Is there a realistic timeframe for finalising offtake agreements?
- If we only have MOUs or LOIs with potential off-takers, how binding are they and are they sufficient to justify shareholder investment?
- Do we understand true delivery costs and buyer's willingness to pay a premium?
- Are we creating flexible pricing models, or assuming a one-size-fits-all?
- Has FID (Final Investment Decision) been triggered or planned with appropriate commercial and technical foundations?

Gate C - Technical Solution & Basic Engineering Readiness

Essential Question:

Have we defined a feasible and deliverable technical solution?

- Has a basic engineering (BE) package been initiated and will it be completed within the timeframe provided by FID approval committee, because without a mature BE package FID discussions remain speculative.
- Are core process and layout decisions technically validated?
- Are we confident that the design meets regulatory, safety, and performance requirements?
- Is the solution scalable and ready for detailed engineering?
- Has a detailed CAPEX, OPEX and LTSA options been established?

Gate D - Stakeholder, Subsidy & Permitting Readiness

Essential Question:

Are the external subsidy providers real or wishful assumptions?

- Have permits and regulatory pathways been identified and scheduled?
- Is there visibility on when and how subsidies will be approved?
- How certain are we of public funding or regulatory support?
- Are key stakeholders and partners committed or speculative?

Gate E - Schedule & Resource Commitment

Essential Question:

Can we deliver this project within realistic timelines and with secured resources?

- Does the organisation have the competent internal resources required to manage the project in a structured, disciplined way?
- If not, has a qualified PMO or external partner been identified and contracted to ensure delivery capability?
- What risks exist to the timeline, and how resilient is the mitigation plan?
- Are human, technical, and financial resources committed and to be mobilised?
- Is this initiative ready for phased implementation?

Gate F - Execution KPIs & Decision Frameworks

Essential Question:

Are we measuring real progress vs Waiting for policy to define success?

- Can we apply execution KPIs: budget, schedule, engineering milestones, risk reduction?
- Have we defined procurement, HR, project delivery and governance models?
- Is the organisation ready to steer the project by competent people, or by hope?

Gate G - Risk & Complexity Management

Essential Question:

Are we overcomplicating with premature regulation or focused on delivery?

- Have we identified all major project risks — technical, regulatory, political?
- Are we layering on bureaucracy before delivery models are proven?
- What contingencies are in place for complexity and change?

Each gate must be passed deliberately before the next can be confidently tackled. While certain activities may run in parallel due to time pressures, **critical decisions must be sequential and evidence-based.**

Ultimately, ask yourself: **Are you managing this hydrogen initiative as a structured project or simply running a policy-influenced campaign hoping for eventual alignment?**

Table: Gate Process for Project Discipline

Gate	Essential Questions and Focus	Who Should Answer

Gate A – Scope & Strategic Alignment	Are we solving a real industry need — or just chasing policy trends? What specific problem does this project address? Is the initiative rooted in demand or speculative subsidy logic?	Project Sponsor / Strategy Lead
Gate B – Commercial Viability & Long-Term Commitment	Do we have binding offtake agreements or are they under realistic negotiation timelines? Are MOUs/LOIs bankable? Has the FID been aligned with true market demand and commercial maturity?	Project Director (with support from Commercial Lead)
Gate C – Technical Solution & Basic Engineering Readiness	Has a BE package been initiated or completed? Are design, layout, safety, and performance benchmarks validated? Is the technical solution scalable and integrable?	Project Director (with Engineering Manager)
Gate D – Stakeholder, Subsidy & Permitting Readiness	Have permitting pathways and timelines been confirmed? Are subsidies approved or speculative? Are key enablers (power, land, water) committed?	Project Director (supported by Permitting Lead / Legal)
Gate E – Schedule & Resource Commitment	Are critical path items identified? Are internal competencies in place or is a qualified PMO retained? Can we execute within defined constraints?	PMO / Project Controls / HR Lead
Gate F – Execution KPIs & Decision Frameworks	Are we measuring execution through defined KPIs (schedule, cost, risk, engineering)? Is governance set up to allow timely decisions and course corrections?	PMO Director / CFO / Governance Board
Gate G – Risk & Complexity Management	Have technical, market, and policy risks been mapped? Are we introducing excessive complexity prematurely? Are fallback scenarios established?	Risk Manager / Project Director

By institutionalizing these Go/No-Go gates, corporations can transform ambition into action or consciously walk away from misaligned, greenwashed ventures. In the green hydrogen era, where external noise is loud and funding flows fast, **project discipline is not a luxury. It's the firewall.**

Bridging the Gap: Green Hydrogen Initiatives and the 2030 Horizon

As the global community accelerates efforts toward a sustainable energy future, green hydrogen has emerged as a pivotal element in decarbonization strategies. By early

2025, the landscape of green hydrogen projects reflects a mix of ambitious announcements and tangible progress.

Global Overview of Green Hydrogen Projects

To contextualize the global development, a regional breakdown of theapproximately 217 projects that have reached FID or are under construction provides insight into where progress is most tangible:

- Europe: Approximately 80-90 projects
- Asia-Pacific (incl. Australia): Approximately 60-70 projects
- North America (primarily USA): Approximately 40-50 projects
- Middle East & Africa: Approximately 15-20 projects
- South America: Approximately 5–10 projects

The trajectory of green hydrogen development is marked by a significant increase in project announcements and investments:

- Project Announcements: As of October 2023, the Hydrogen Council reported 1,418 clean hydrogen projects announced globally, representing direct investments of approximately USD 570 billion. A Financial Times article in late 2023 estimated the number of announced green hydrogen projects to exceed 1,500. (hydrogencouncil.com, ft.com)
- Final Investment Decisions (FID): Of these, approximately 217 green hydrogen projects have either reached FID or are under construction globally, according to multiple industry-tracking platforms including Strategy& (PwC) and IEA insights. This confirms that only a fraction roughly 14% of all announced initiatives have progressed beyond planning as of early 2025.

Regional Highlights

Europe:

- Germany: Germany has been proactive in advancing green hydrogen infrastructure. In March 2025, the German network regulator proposed a fixed annual fee to kick-start the development of a 9,700-kilometer hydrogen pipeline network, aiming for completion by 2037. Additionally, BP has taken FID to develop the 100 MW Lingen Green Hydrogen plant in Lower Saxony, scheduled to begin construction in 2025 and commence operations in 2027.
- Norway: Norway is also making strides, with GreenH reaching FID on its 20 MW Bodø hydrogen project in January 2025. This facility is expected to start commercial operations in 2026, supplying fuel for the Vestfjorden ferry route.

United States:

The U.S. is witnessing substantial investments in green hydrogen. Plug Power secured a $1.66 billion loan guarantee from the Department of Energy to construct up to six green hydrogen manufacturing plants across the country, each capable of producing up to 15 tons of liquid hydrogen daily.

Challenges and Outlook Toward 2030

When Will We Actually Meet the 2030 Hydrogen Goals?

The 2030 targets for green hydrogen are ambitious: global production capacity for low-carbon hydrogen should reach between 100–130 million tonnes (Mt) annually by 2030 according to the Hydrogen Council and IEA. However, as of early 2025, the projects that have reached FID or are under construction represent less than 5 Mt/year in capacity — a mere fraction of the goal.

To meet the 2030 target, the world would need a nearly 20-fold increase in green hydrogen project execution within the next five years a pace that is historically unprecedented for capital-intensive industrial infrastructure.

The structural timeline alone presents a bottleneck: hydrogen projects typically take 4–7 years to secure permits, finalize engineering, attract investment, build, and enter operations. This means that projects not already in advanced development or FID by 2025–2026 are unlikely to contribute to the 2030 output target.

As things stand, if current rates of progress continue and systemic barriers are not swiftly resolved, the 2030 hydrogen goals may only be fully realized around 2045–2050.

This gap highlights the urgent need for not only faster permitting and clearer subsidy frameworks, but also corporate-level readiness, resource-backed planning, and strict project gatekeeping all of which are still absent in the majority of initiatives.

Several critical factors explain why only 217 out of more than 1,500 green hydrogen initiatives have reached Final Investment Decision (FID) or are under construction:

- Uncertain Offtake Agreements: Many projects lack binding long-term offtake agreements. Without clear buyers willing to commit at premium prices, investors hesitate to greenlight capital-intensive facilities.
- Technical Immaturity and Risk: Some projects depend on technologies that are still pre-commercial or FOIK (first-of-its-kind), raising engineering and integration risks that delay progress.
- Permitting and Regulatory Bottlenecks: In numerous jurisdictions, permitting remains complex and fragmented, adding uncertainty and multi-year delays.

- Overreliance on Subsidies: A significant portion of announced initiatives is speculative, hinging on yet-to-be-approved public funding or policy frameworks. Delays or revisions in subsidy mechanisms can stall momentum.
- Supply Chain and Execution Readiness: Even well-planned projects are constrained by limited EPC capacity, electrolyzer availability, and long lead item logistics.
- Project Management Gaps: Many initiatives have been launched as policy-driven concepts rather than structured, resource-backed projects. Without robust gate-based project management, they falter before reaching execution readiness.

While the pipeline of announced green hydrogen projects is robust, the gap between announcements and real projects reaching FID underscores significant challenges:

- Investment Realization: The Hydrogen Council's December 2023 update indicates that out of the USD 570 billion in announced investments, only a portion has progressed to FID or construction phases highlighting a significant discrepancy between ambition and execution.
- Regional Disparities: In regions like Australia, challenges such as high production costs, infrastructure hurdles, and uncertain demand have led to the stalling or abandonment of numerous green hydrogen projects. Reports indicate that 99% of announced capacities have not progressed beyond initial stages, with major players scaling back their ambitions.

Final Conclusion

The numbers may not be accurate but they give us perspective: We are not on track.

The hydrogen economy has been inflated by ambition, yet slowed by execution. Out of more than 1,500 green hydrogen initiatives, only 217 have reached FID or construction revealing the stark disconnect between vision and verifiable progress.

While government policies, subsidy frameworks, and public support remain crucial, it is corporate project discipline, grounded in technical, commercial, and operational realism, that will determine the actual speed of the energy transition.

If we are to transform hydrogen into a true decarbonization pillar, we must not only aim high we must build right, act fast, and manage smart.

Now is the time to ask not what's possible but what's deliverable. And deliver it.

Annex

Example Case Insight: What Norway's Blue Hydrogen Failures Reveal About Project Management Discipline & Governance

While this document focuses on green hydrogen, recent high-profile cancellations of even blue hydrogen projects in Norway offer a compelling example of what happens when Gate discipline is missing.

Flagship projects involving Equinor, Shell, and Statkraft were discontinued despite early announcements and initial government interest. Key shortcomings included the absence of binding offtake agreements, speculative dependence on future subsidies, and unresolved permitting and infrastructure issues.

These shortcomings align clearly with skipped checkpoints in the Gate process:

- **Gate B (Commercial Viability):** No committed long-term buyers or reliable market pricing.
- **Gate C (Technical Readiness):** Unfinished engineering definition and technical feasibility.
- **Gate D (Permitting & Subsidy Clarity):** Overreliance on regulatory assumptions and uncertain state support.

These examples underscore a critical point: **hydrogen project failure is not about green or blue it's about decisive and disciplined project management**. Color is secondary.