Legislative Testimony of Nathan Iyer
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Hydrogen Hubs and Climate Change
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Thank you all for the opportunity to speak with you today about the potential for hydrogen hubs in Pennsylvania. My name is Nathan Iyer. I work at RMI, a technical non-profit, focused on economic and market-based solutions for the energy transition. Our mission is for the clean hydrogen industry to succeed, by both driving down emissions and achieving sustained growth.

I will cover three major points:

1. Pennsylvania has key resources and solid strategic position for hydrogen production
2. The importance of disciplined investments to support high-value hydrogen deployment and avoid dead-ends and uneconomic use cases; and
3. Building regulatory state capacity to ensure Pennsylvania is the place to build clean power and supporting midstream infrastructure necessary for the hydrogen hubs to succeed.

As with all emerging technologies, the economics are a helpful guide to understanding the role of hydrogen in the energy sector. Hydrogen is an expensive substitute to be a dispersed fuel for residential consumers – its role instead lies at the heart of large-scale industrial projects, like steel, clean fuels, refining, chemicals, and large transportation. And those industries are not just key to the modern world – but are also critical to Pennsylvania's economy and can be sources of good, sustaining jobs for the community into the future.

The public resources available for clean hydrogen development in this state are extraordinary.

- Pennsylvania leadership secured a place in two hydrogen hubs, the only state in the country to do so.
- The state is also one of the first to provide demand-side tax credits, a clear frontrunner.
- World-class hydrogen credits, clean electricity credits, and carbon capture credits are available thanks to historic investments led by Pennsylvania's congressional delegation.
- Electricity and hydrogen storage are also incentivized to ensure reliability of the grid, and industrial production.
- And of course, the vast array of loans available to common carrier infrastructure and key manufacturers complete the story.

These incentives add up, and Pennsylvania leadership both here and in DC played a major role in creating this opportunity.

With this arsenal of tools available from the state and federal government, one gets a sense of both possibility and risk. We are diving forward into new, complex technologies, often with a lot of uncertainty – about costs, about use cases, about infrastructure.

21st century energy technologies have enabled a new story for the hydrogen industry. Solar and wind have become incredibly cheap – larger turbines, hyper-cheap solar panels, and industry disrupting batteries have changed the options we have at hand. As global gas markets were roiled following the invasion of Ukraine, green hydrogen's promise became evident - fixed clean power assets with zero on-site emissions, decoupled from rapid price shocks, and able to fuel clean industrial production.

That dream is real. The techno-economics indicate clear, cost-effective pathways to use hydrogen for specific applications. This moment calls for discipline to successively scale hydrogen development as a low-pollution and jobs-producing opportunity – to avoid investing in dead-ends, stranded infrastructure, or leading to more pollution than we started with.

Hydrogen is like a variety of other energy-intensive sectors – competitiveness is driven by location, where energy is cheap and abundant. And let me be clear – there are regions in the country with stronger wind, solar, geothermal resources. But it doesn't always need to be sunny in Philadelphia – the state can make up this ground with smart investments: midstream infrastructure, technology improvements, and integrated demand.

The federal laws that provide these investments are very explicit – public dollars should only go to projects that actually reduce emissions, and the federal government is trying to create a solid accounting framework that states can build on with confidence.

For methane-based projects, getting fugitive methane under control (and for emissions reducing project, the key threshold is below 0.2%) is one of the best things the state could do to ensure that that carbon capture hydrogen projects will remain competitive in the long-term. Methane calculations have relied on old emissions factors, estimation, and self-reporting, rather than consistent and accurate measurement– recent analysis from satellite and flyover data have found these methods lead to major underestimates. All this investment and progress can be undone by a few leaky wells.

For green hydrogen projects, the barriers are not primarily accounting issues, but traditional physical bottlenecks to clean energy development in the real world — siting and permitting, interconnection, transmission, and large project management. These challenges drive up the cost of electricity and in kind make hydrogen projects less viable. Efficiently building new clean capacity to serve new load is the challenge at hand— not accounting.

As part of PJM, the state is facing interconnection issues for new generation (PJM's queue is among the most backlogged in the country). Pennsylvania and the PJM region must determine how to streamline new resource entry, including by planning for transmission, and learning how to reliably serve major load growth with increasing levels of clean energy. If unaddressed, these challenges can halt the clean electricity growth that the industry needs. Building the will to find and implement solutions requires more pressure and engagement from member states to ensure PJM transitions to a reliable, affordable, clean energy system as fast as practicable.

There are several additional ways the state could support a successful hub:

1. **Making Pennsylvania the best state to site** any clean hydrogen, renewables, or industrial decarb project.
2. **Strategic end-use prioritization –** the first projects coming out of the gate are typically smaller blending and power projects, which can sign the long-term offtake agreements that producers need up front, but may have limited emissions benefits and more competitive alternatives. But the larger industrial clusters that truly need hydrogen require up-front investments- this project on project risk creates more complexity and could use state support - in terms of investments, coordination, and regulatory drivers – that can unlock these more valuable assets.
3. **Open access midstream infrastructure,** including transmission and grid upgrades, hydrogen pipelines and storage, CO2 pipelines, and Class 6 wells.
    - Without open access connecting infrastructure, a hub is just a random bundle of projects – public money can create a foundational network that can attract larger investments and extend outwards.

The federal incentives and regulations all point in one direction – building new infrastructure is crucial to meet this moment. Pennsylvania, by nature of its geography, industry, and skilled workforce, has a chance to create backbone infrastructure that enables a cleaner economy that could last for half a century – this is legacy defining work.

Focusing on productive enabling policy, avoiding technological or economic dead ends, and building state capacity to support this work all are critical pieces to making this work.

I'm not here to downplay the challenges - linear infrastructure, filled with new gases, will create legitimate concerns from the communities that live nearby; folks want to know up front they are in good hands. And Ben Franklin's words in Philadelphia ring true here – "an ounce of prevention is worth a pound of cure".

But regulatory capacity doesn't just mean slowing things down. A regulatory body that creates confidence, that can process and move permits rapidly, and that can **proactively problem-solve** alongside industry and communities can create a system that accelerates a buildout of the clean hydrogen industry that reduces emissions long term. The world has seen how fast Pennsylvania can build a bridge – that's the spirit it'll take to build out the truly clean energy infrastructure required for successful hydrogen hubs.

Thank you for your time and work on this important issue.