



Industrial Energy Consumers of America *The Voice of the Industrial Energy Consumers*

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**U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
REQUEST FOR INFORMATION (RFI)
DE-FOA-0002369
“HYDROGEN TECHNOLOGIES”**

Organization: Industrial Energy Consumers of America

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Executive Summary

The Industrial Energy Consumers of America (IECA) and its member companies desire to work in collaboration with the U.S. Department of Energy (DOE) to advance hydrogen as an economic option to assist the manufacturing sector in the reduction of greenhouse gas (GHG) emissions. We are interested in advancing technology that would provide for economic hydrogen and related products as a substitute for fossil fuels that we consume or as a fuel for generating power consumed on-site or for fuel cells. Another area of interest is the conversion of waste hydrocarbons, like plastics, into hydrogen and storage.

IECA members are manufacturing companies, some of which currently produce and consume hydrogen. Our companies are interested in considering R&D projects at their facilities. We are, therefore, important stakeholders with which to collaborate.

Industrial Energy Consumers of America

IECA is a nonpartisan association of leading manufacturing companies with \$1.1 trillion in annual sales, over 4,200 facilities nationwide, and with more than 1.8 million employees. IECA membership represents a diverse set of industries including: chemicals, plastics, steel, iron ore, aluminum, paper, food processing, ammonia and fertilizers, insulation, glass, industrial gases, pharmaceutical, building products, automotive, independent oil refining, and cement.

Uniqueness of the Manufacturing Sector

Most IECA companies are energy-intensive trade-exposed (EITE) industries, which means that small increases to the cost of energy inputs, such as hydrogen, can have direct impacts to

competitiveness. Many of our companies produce hydrogen for sale to customers or for internal consumption. EITE industries consume upwards of 80 percent of the natural gas and electricity of the U.S. manufacturing sector.

IECA companies include many very large manufacturing companies, most of which are global. All have high level engineering technical skill levels. All have sustainability goals to reduce energy consumption and reduce GHG emissions or energy intensity. As compared to other sectors of the U.S. economy, the manufacturing sector is the most challenging to decarbonize because commercially scaleable and economically rationale decarbonized product production process technology does not exist. Capital stock turnover can be up to 50 years.

Most natural gas fueled manufacturing processes cannot be converted to electrification. Plus, use of electricity on a Btu basis is far more expensive than natural gas and would render companies uncompetitive. Manufacturing companies operate 24/7 and require reliable electricity. Many of the U.S. locations of production facilities also lack access to renewable sources of electricity.

INPUT ON HYDROGEN RESEARCH AND DEVELOPMENT

Hydrogen in natural gas pipelines

For manufacturers, hydrogen mixed with pipeline natural gas raises more questions and concerns than answers. Manufacturing product production processes are very diverse and no one, to our knowledge, has surveyed these companies to determine how various levels of hydrogen in the natural gas pipeline would impact their complex and capital-intensive production processes. Because of the unique characteristics of hydrogen, there are financial, engineering, and safety drawbacks.

Almost all IECA manufacturers have natural gas-fired electric turbines. We can confirm that hydrogen in the natural gas pipeline would damage these turbines and compressors. We acknowledge that you are working with turbine manufacturers to address these important problems.

Other IECA companies rely on natural gas as the primary feedstock for their production, including ammonia and specialty chemicals. These companies could be forced to expend considerable financial resources to remove any excessive hydrogen prior to allowing the natural gas into their manufacturing processes.

- **Recommendation:** We encourage the DOE to work with IECA to conduct a survey of manufacturing companies on potential impacts of hydrogen in natural gas delivered by pipeline.

Electric utilities, hydrogen and economics

As large consumers of electricity, it is important for manufacturing companies in the United States to have access to reliable and economically priced electricity. All electricity costs are passed onto us, the ratepayer. Our companies compete globally and increases in electricity costs

for manufacturers would undermine global competitiveness and threaten the loss of jobs and manufacturing across the United States.

While we recognize the potential value of hydrogen for electricity generation, at present, the manufacturing industry is concerned that the near-term prospects for hydrogen use in electricity generation would make it too expensive for manufacturing companies to utilize and remain globally competitive. We encourage that any DOE analysis into this area delve fully into the practical and commercial implications of the potential use of hydrogen and other technologies to determine whether there is an economically feasible manner to develop hydrogen for electricity generation.

Onsite hydrogen production for onsite production of electricity versus into pipelines

This approach assumes site specific large producers of hydrogen that produce onsite electricity that is placed onto the grid.

- **Recommendation:** Rather than putting hydrogen into the natural gas pipeline, it is better for hydrogen producing facilities to convert the hydrogen directly into electricity onsite and not inject it into the pipeline thereby impacting consumer equipment and economics.

Hydrogen production from waste materials like plastics and tires

Some manufacturing companies produce and consume large amounts of plastics. These waste materials have high hydrocarbon content, some of which that have a Btu value equal to gasoline. Processes to convert those waste streams into hydrogen is probably one of today's lowest cost sources of hydrogen. This is an area that manufacturers would like to work with the DOE.

Hydrogen storage and transportation

IECA member companies also produce ammonia, which is an important transport and storage mechanism for hydrogen energy and can help accelerate the move to hydrogen in an efficient and scalable way. Ammonia storage, transport and distribution channels are well established in the United States and globally. We encourage DOE's research initiatives and R&D projects designed to boost ammonia's role in hydrogen transportation and storage and ongoing DOE efforts to consider ammonia as fuel in its own right.

Hydrogen as a fuel option for the manufacturing sector

We appreciate the fact that DOE's efforts are directed toward developing large sources of low-cost hydrogen. Significant technology breakthroughs will be necessary in order for hydrogen to be competitive with natural gas.

- **Recommendation:** We encourage the DOE to establish a program specifically for manufacturing companies to compete for grants to fund private sector R&D projects. Funding for projects at manufacturing facilities is a faster way to advance technology commercialization than, for example, funding a national lab or a university.

GHG life cycle analysis is essential for each alternative technology

Transparency is needed in the GHG lifecycle of each technology alternative to ensure that new technology options lower rather than increase GHG and NOx emissions. There are questions, for example, about the potential GHG emission benefits of using natural gas and coal to produce hydrogen and achieve net lifecycle GHG reductions. As the DOE and industry moves forward on the production of so-called green and blue hydrogen, industry should also be included in the efforts to define those terms in a meaningful manner. A bright line is needed.

Thank you for working so diligently to advance the hydrogen economy. We look forward to working with you.

Sincerely,

Paul N. Cicio

Paul N. Cicio
President