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HOUSE OF REPRESENTATIVES
COMMONWEALTH *of* PENNSYLVANIA

House Democratic Policy Committee Hearing

Clean Energy Manufacturing

Tuesday, July 30, 2024 | 10:00 a.m.

Representative Mandy Steele

OPENING REMARKS
10:00 a.m. Rep. Mandy Steele, D-Allegheny

PANEL ONE
10:05 a.m. Paul Bush, VP, Technical Services, Sustainability & Gov't Affairs
Vitro Architectural Glass

Q & A with Legislators

PANEL TWO
10:30 a.m. Doug Gudenburr, Chief Operating Officer
DMI Companies

Erik Widner, Vice President of Technical Operations, North America
Exus Renewables

PANEL THREE
11:00 a.m. Donald Evans, Chief Executive Officer, President
Pittsburgh Gateways Corporation

Hello, and thank you for the opportunity to address this committee, and for your invitation to speak to you regarding the importance of sustainability and environmentally responsible manufacturing specifically here in the commonwealth of Pennsylvania.

My name is Doug Gudenburr, I serve as Chief Operating Officer for DMI companies and have been an employee of the company since 1982.

During my tenure with DMI companies I have had the distinct privilege to witness the history and growth of our company in the manufacturing space and within our development as a sustainable manufacturer.

DMI was founded in 1978 by Peter J. Arnoldt as Ductmate Industries Incorporated. Through the years, DMI has grown to five distinct strategic business units: Ductmate Industries, Aire Technologies, GreenSeam Industries, and Linx Industries and our newest SBU, Airoverse. As a medium sized business here in Pennsylvania we manufacture and produce HVAC (Heating, Ventilations and Air Conditioning) ducting and ducting components for commercial and industrial applications such as hospitals, office building construction, sewage treatment facilities and a large number of other commercial construction projects requiring HVAC systems.

Our largest and oldest manufacturing operations exist here in Pennsylvania. Located locally in Monongahela, PA and is our flagship factory where we produce the largest number of our products. The Monongahela plant employs ~190 Union staff and another 50-management staff. We are especially proud of our corporate offices in Charleroi PA, being listed both as a registered historic landmark and as an Energy Star high efficient certified facility which houses our executive management, sales and G&A teams.

From the outset of our beginning sustainability has been part of our business model. Our earliest products which we continue to produce incorporate in their design a focus on using less material, improving the effectiveness of HVAC systems and the efficiency of energy use in those systems through self-sealing and or effective engineered characteristics.

Our first product DM-35 was specifically designed to eliminate leakage in high pressure air systems allowing for sealed connections between ducting units, which in turn provides

exceptional energy efficiency in HVAC systems, by eliminating increased horsepower demand or extended fan operation to achieve the desired ambient temperature through airflow. This strategy and environmentally based ethics have remained a focus of our designs with new products as DMI has grown over these last four decades.

DMI companies continue to strive to be an example for other manufactures across the commonwealth and nation in a number of ways. We support environmental stewardship from the first day with new employees, have a long-standing track record of environmentally based culture within our business with recognition from the Green Building Alliance, USGBC (US Green Building Council) and KEEA (Keystone Energy Efficiency alliance).

We operate in four (4) states and conform our facilities to an environmental ethic of Zero waste, responsible use of materials and energy conservation. Two of our four facilities nationwide have been certified as TRUE Zero Waste to Landfill with a third facility practicing zero waste to landfill. All of our factories operate under LED lighting only, we seek new technologies to allow us to pursue further success both in environmental stewardship and manufacturing.

We are proud of our history, the projects, products and people who make DMI a successful and sustainable manufacturer. Within the scope of our future plans, we expect to continue to grow along the guidelines of sustainability within the manufacturing industry where we are committed to finding solutions that allow us to become Energy Neutral, reduce our Greenhouse gas emissions and produce our own renewable power here in Pennsylvania.

Within these goals exist plans and objectives to attain both wind and solar power options in line with our corporate initiative which we have labeled “Carbon Blue”. This initiative is paramount to us as we hope to help drive the economic future of manufacturing in the commonwealth and the United States at large.

As our research has been ongoing, we have looked at many proposals and financial documents that provide us with perspective to prepare our plans to develop a renewable powered facility.

After reviewing these proposals naturally, we have many more questions. Specifically with regard to the financial risks and benefits associated with the installation of renewables at an industrial scale. Many facilities that have already successfully implemented solar power are warehouses or offices that do not require enormous amounts of power unlike an industrial factory. To put this into perspective our Monongahela plant used 2.2 million KWH during 2023 alone.

One proposal provided to us was at a cost of over $5 Million. This, in comparison to the annual spend of $170,000 per year on purchased power, seems fiscally irresponsible. We are continuing to look for solutions to this problem and develop strategies that can allow for success for this project goal.

Within the financial options that exist are tax incentives, grants and loan programs. However, there is still the risk associated with capital expenditure of millions of dollars for any size company. Regardless of the assistance provided, any company that would seek to implement renewables would be required to develop a responsible ROI (return on investment) which in many cases does not provide a reasonable and equitable return.

In addition, the programs and sustainability projects we have committed to do not come without challenges and hurdles. As with any notable endeavor the difficulties of achieving them can seem insurmountable for small and medium manufacturers, however with the right tools it is possible to overcome these obstacles. One such challenge is the viability of renewable power projects in physical space and the funding needed to be successful. Although many opportunities exist for funding there are direct challenges related to accessibility and communications between businesses and government who control these funds.

One example, from DMI's perspective is our attempt at entering the application process for 48C funding from the Department of Energy. The application process, although seemingly straightforward, caused difficulties for our limited staff in final submission. There were deadline changes, website changes and problems with contacting the DOE helpdesk when we encountered issues related to submitting our application.

Although these issues can normally be resolved there exists a disconnect between businesses who seek funding, and the staff of federal and state departments who we ask for help when these problems arise. Members of our staff had difficulty getting direct information and answers related to submissions for funding. This is not of course without its own challenges. As the Department of Energy is a large entity and must deal with large numbers of calls and inquiries related to a number of various issues.

Additionally, the volume of material and documents associated with the research and development of plans to find and execute funding can be quite daunting. One such example is the guidebook to the Inflation Reduction Act. At 184 pages this document, although all-encompassing and filled with valuable information, can be difficult to navigate for persons and staff who are not experts in these fields.

Many businesses, both small and medium, can and will have issues working through these programs without dedicated multi disciplined teams to ensure success. As many

businesses look to find funding and resources to allow them to work towards environmental goals the quick and accurate accessibility of information is crucial.

Within the manufacturing zone of influence the amounts of energy consumed and wasted are larger in many cases than any other industry. This reliance on energy is a foundation and cultural issue in the movement of manufacturing into the sustainability and green energy job front.

As DMI Companies continues to move forward with its goals we will continue to seek collaboration and partnership where possible to advance sustainability and energy efficiency in manufacturing in an expeditious manner. With the guidance from other industries, government and our own networks we believe this to be more than possible.

This holistic approach to finding solutions for environmental stewardship and sustainability cannot be underestimated, the ability for industrial manufacturers, other business, academia and goverment to connect and discuss ideas is one of the most valuable tools available in our current time. With the assistance of local, state and federal agencies, sustainable manufacturing on a large scale is not hopeless. The future is bright and we at DMI look forward to being part of it.

Thank you again for the opportunity to address you and the committee.

Respectfully

Doug Gudenburr

Chief Operating Officer

DMI Companies

Paul W. Bush
Vice President, Technical Services,
Sustainability & Government Affairs

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July 26, 2024

Mr. Cody Carlson
Leadership Research Analyst
Pennsylvania House Democratic Policy Committee
Chairman Ryan Bizzarro

Subject: PA House Democratic Policy Hearing on Clean Energy Manufacturing: Vitro Comments.

Dear Mr. Carlson,

Thank you for the opportunity to host the Pennsylvania House Democratic Policy Hearing on Clean Energy Manufacturing and for the chance to provide comments. In the spirit of cooperation with the effort to expand Clean Energy Manufacturing in Pennsylvania, I offer comments on three areas of potential improvement. The comments are followed by some brief background information on Vitro Architectural Glass whose headquarters are located in PA House District 33.

Permitting & a Vitro Pennsylvania Clean Energy Manufacturing Investment Example: Capital costs for factories to produce float glass products range from $90 million for the restart of an idled line to $180+ million for 'greenfield' construction. A greenfield factory requires three or more years to build, whereas a rebuild of an idled line can be accomplished in 18 months or less. • Vitro Architectural Glass has an idled float line located in Meadville, PA, which is ideally located to supply U.S. renewable energy solar panel manufacturers located in the East and Midwest regions. This idled line produced glass from 1970 until 2020 with four complete rebuilds and technology updates during that timeframe. • After a 4-year shutdown of the line, Vitro is funding a $90MM capital investment for the Meadville, PA line rebuild; primarily a 2024 investment. • First glass ribbon pulled and **solar PV panel glass** delivery targeted for second quarter 2025. • Estimated 120-140 new full-time jobs; significant new employee training will be required. • $80,000 average wage including benefits, ($21+/hour (wage w/o benefits) x 2,000 hours x 140 employees > $5.8MM annual wage increase); Additional employees will be added throughout the supply chain, likely doubling this wage increase. • Vitro intends to add pollution control equipment as part of the investment. • Low turnover expected; furnace campaign is 12+ years. • Produces enough solar glass each year for approximately 3.5GW of crystalline silicon modules. The start-up of this clean energy manufacturing project and the addition of the new jobs is in jeopardy of being delayed due to the PA air permit. In October 2023, Vitro made an application for the Air Permit to restart the Meadville float glass manufacturing line via an expedited process through Governor Shapiro's Action Team and the process is just now nearing completion. This

extremely long, expedited review process is a barrier to not just Clean Energy Manufacturing in Pennsylvania but to all manufacturing in Pennsylvania.

Permitting Comments: Thank you for enacting permit review in this year's budget. This is a recognized step in the right direction. Along with that work we express our desire to see improvements in Pennsylvania's permitting process via an immediate short-term correction that bolsters Pennsylvania's manufacturing while protecting Pennsylvania's air, land and water from pollution. Again, we understand and thank the legislature that an effort is underway to reform the state's permitting process; however, this reform will take some time to accomplish and then even more time to determine if it has indeed been helpful. We express our desire to see improvements in the process in the short-term and that both the expedited and normal permit process have goals of shorter completion times than the respective current processes or Pennsylvania may miss this opportunity to expand Clean Energy Manufacturing.

State Energy Code Comments: Thank you for providing funding in the budget for Pennsylvania schools to include on-site renewable energy. On-site renewable energy has many benefits, including providing some building power during a brown-out or power outage and of course off-setting the electricity needing to be purchased from the grid. The request here is to require on-site renewable energy for Pennsylvania's commercial buildings by updating Pennsylvania's commercial building energy code. PA is lagging behind as the current state commercial building energy code is more than 10 years old, ASHRAE 90.1-**2013** and this should be updated to either ASHRAE 90.1-**2019** or 90.1-**2022**. The glass for the window requirements, are the same in both versions of the updated codes; however, from a renewable energy viewpoint, Vitro would strongly prefer 90.1-2022 which is where the on-site renewable energy requirement was first added to the primary code language. Having on-site renewable energy requirements aligns with the recent efforts on Pennsylvania schools, takes an important step to making Pennsylvania buildings net-zero and provides on-site electricity in the event of brown-outs or power failures. As an alternative, ASHRAE 90.1-2019 with additional addenda by, cc, ck, cp (these addenda together address the renewable energy requirements that are written into the primary code language in the 2022 version) could also be adopted. With the on-site energy required by either version of the code the Pacific Northwest National Laboratory has determined that the building energy reduction is approximately 4.5%-9%.
Cost effectiveness reports from the U.S. DOE are from one version of the code to the next version (90.1-2013 to 90.1-2016, then 90.1-2016 to 90.1-2019) so they are stepwise, but show the life cycle cost effectiveness and savings to consumers for each step. Similar cost effectiveness reports for ASHRAE 90.1-**2022** are in progress but not yet published. Nonetheless, there is now an official determination by U.S. DOE on the energy savings of 90.1-2022 versus 90.1-2019 (https://www.energycodes.gov/determinations and https://www.energycodes.gov/sites/default/files/2024-02/Standard_90.1-2022_Final_Determination_TSD.pdf) which shows that overall, at a national aggregated level it saves 9.8% in site energy (EUI) and 8.9% in energy cost. For Pennsylvania, 90.1-2019 is 7.6% more efficient than 90.1-2013, and with the recent DOE determination you can estimate 90.1-2022 is approximately 15% more efficient than Pennsylvania's current ASHRAE 90.1-2013 commercial building code. An updated PA building code requiring some level of on-site renewable energy supports all clean energy manufacturers, including those in Pennsylvania, while providing many benefits to the building owners and occupants.

State Tax Credits and Incentives for Float Glass & Vacuum Insulating Glass: Federal and state incentives are needed to enable investments in clean energy manufacturing. These investments are critical to establishing a reliable domestic renewable energy supply chain and domestic low embodied carbon material supply chain while bringing good manufacturing jobs to Pennsylvania. Vitro wants to explore incentive opportunities to assist with capital investment, employee training and development, green/renewable energy product manufacturing in Pennsylvania and any other grants or incentives that may be available to us.

Float Glass: The demand for clean, zero-emissions energy production has never been higher. Currently, there is very little capacity in the United States to produce the float glass products needed for solar modules. As the largest North American manufacturer of float glass, with U.S. headquarters and substantial manufacturing operations in Pennsylvania, Vitro encourages strengthening the domestic supply chain for solar energy components and urges state and federal government support for such efforts. The surface glass component of a photovoltaic solar module is high-transmission glass that is critical to all solar modules. Constructed of float glass, surface glass components are engineered to maximize the power output of the module. Additionally, both the surface and base glass components provide structural rigidity to solar modules (Sandia National Lab report SAND2019-14301J). These glass components also provide excellent electrical insulating properties while protecting the solar module from wind, hail, sand and other mechanical damage. In summary, glass is proven to be the best material currently available to protect photovoltaic cells from the environment, simultaneously improving the structural strength and providing the necessary electrical insulation while maximizing photovoltaic cell output, all at a reasonable cost. Glass is the right component for renewable energy, now let's make it a domestic component with incentives to assist with the large capital investment required for additional domestic capacity. Note: At the Federal level, the IRA missed supporting glass as the back-plate for solar modules as they unintentionally used the phrase, "Polymeric Backplate", which does not include glass. Vitro has submitted requests for determination to the U.S. Treasury with support from DOE. To date no ruling has been determined.

Low Embodied Carbon Vacuum Insulating Glass, VIG: VIG units achieve superior insulating performance by maintaining a vacuum between the glass lites. VIG's insulate 4X better than conventional dual-glazed windows and 2-3X better than triple-glazed windows. The benefits include significant energy and operational carbon savings; a warmer interior glass surface; less condensation; reduced indoor convective air currents for less drafty windows, and reduced size of the HVAC equipment required, resulting in lower equipment costs and additional energy savings. VIG products are a major part of the solution to reach net-zero buildings. Today, there is no North American manufacturer of VIG units, all are imported. The large capital investment for a VIG factory, $60MM comes with a 25% tariff on the equipment as the only current source of the equipment is China. Vitro Architectural Glass has a large presence in Pennsylvania which is uniquely situated to serve the northern U.S. climates with an energy efficient VIG product. State incentives are needed to bring a VIG plant to Pennsylvania.

Vitro Information:

- Vitro Architectural Glass is the largest North American glass producer.
- Over 100 years of experience producing architectural and automotive glass in the U.S. Canada and Mexico
- 35 production facilities in North America
- Serving over 1,000 customers in 30 countries

- Vitro operates both union-free and union-represented facilities throughout our regions and works with vendors, contracting firms and supply customers that have either employee group. Our goal is to foster strong working relationships and partnerships with our employees, suppliers and customers.
- Strong history of workplace safety.
- Prioritizing community support at all locations.
- 14,500+ global employees • 2,437 employees in the U.S. • 1,242 employees in Pennsylvania
- Average earnings of $80,000 in annual pay and benefits for hourly production employees
- Vitro manages 10 large thermal reactors that run 24/7 for 15 years or more with an average annual reinvestment of $50+MM.
- Proprietary oxy-fuel furnace technology is used in glass production to reduce energy consumption by as much as 20% and cut greenhouse gas emissions in half.
- Additional annual reinvestment of $60-250MM for: Improving operational efficiency • Lowering energy consumption • Reducing environmental impact • Additional investments have been made in the renewable energy space, including Solarvolt™ Building Integrated Photovoltaic (BIPV) glass and a partnership with First Solar, the U.S.'s largest solar PV module manufacturer.
- Vitro operates North America's largest Glass R&D facility which has produced more than 500 patents in the past 30 years, with more than 200 still active.
- Vitro flat glass products meet the Federal Buy Clean Initiative, the Build America, Buy America Act (BABAA), the U.S.GSA Low Embodied Carbon Material requirements and all state Buy-Clean regulations including Buy-Clean California and Buy-Clean Colorado.

Please let me know if there are any questions or if I can be of further assistance. Thank you in advance for your consideration of my comments.

Sincere regards,

Vice President, Technical Services,
Sustainability & Government Affairs
Vitro Architectural Glass
The first Cradle to Cradle Certified^{CM} Architectural Glass.

Att: Vitro Fact Sheet

Our History

- Formed the largest North American glass producer by acquiring PPG Flat Glass.
- Over 100 years of experience producing architectural and automotive glass in Mexico and the U.S.
- Strong history of workplace safety.
- Prioritizing community support at all locations.

Government Participation

- Participated in projects with the U.S. General Services Administration (GSA), the U.S. Department of State (DOS) and the U.S. Department of Energy (DOE) as well as several of its National Laboratories.
- Meets federal climate policy, including low embodied carbon (LEC) standards set by the GSA and the Inflation Reduction Act (IRA) as well as ENERGY STAR® certification.

Efficiency Investments

- Vitro manages 10 large thermal reactors that have run 24/7 for 15 years or more with an average annual reinvestment of $50+MM.
- Annual reinvestment of $60-250MM for:
  - o Improving operational efficiency
  - o Lowering energy consumption
  - o Reducing environmental impact
- Additional investments have been made in the renewable energy space, including *Solarvolt*™ Building Integrated Photovoltaic (BIPV) glass and a partnership with First Solar.
- Proprietary oxy-fuel furnace technology is used in glass production to reduce energy consumption by as much as 20% and cut greenhouse gas emissions in half.
- Vitro also operates North America's largest R&D facility which has produced more than 500 patents in the past 30 years, with more than 200 still active.

Sustainability Achievements

- All Vitro Architectural Glass products meet the Top 20% LEC material category, which qualifies for the "most preferred" product standard.
- Flat glass products meet the Federal Buy Clean Initiative, the Build America, Buy America Act (BABAA) and all state Buy-Clean regulations including Buy-Clean California and Buy-Clean Colorado.
- First architectural glass to be *Cradle-to-Cradle Certified*®.
- First to have Environmental Product Declarations (EPDs) for flat and processed glass products.
- Annual sustainability report reviews environmental responsibility, social equity and transparency.

Product Innovations

- *Solarvolt*™ Building Integrated Photovoltaic (BIPV) glass enables buildings to generate their own renewable energy.
- *VacuMax*™ Vacuum Insulating Glass (VIG) delivers thermal insulation performance up to 20 times better than the glass in most buildings today.
- *Starphire Ultra-Clear*® glass is essential to the U.S. Department of Defense for transparent armor and blast-resistant glazing.
- Manufacture energy efficient products with ENERGY STAR® qualified performance, including *Solarban*® low-emissivity (low-e) glass.
- The volume of *Sungate*® and *Solarban*® low-e glass products supplied in 2023 will generate a total carbon savings of 1.47 million pounds of CO_2 equivalent each year the glass remains installed.

Vitro
Architectural Glass

vitroglazings.com

Our People and Plants

- 14,500+ global employees
- Serving over 1,000 customers in 30 countries
- 35 production facilities in North America
- 2,437 employees in the U.S.
- 1,242 employees in Pennsylvania
- Average earnings of $80,000 in annual pay and benefits for hourly production employees

Vitro operates both union-free and union-represented facilities throughout our regions and works with vendors, contracting firms and supply customers that have either employee group. Our goal is to foster strong working relationships and partnerships with our employees, suppliers and customers.

Vitro Pennsylvania

Vitro U.S.A

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