CDTC

Freight Advisory Committee

DRAFT MEETING MINUTES
November 17, 2021, 9:00 AM
Virtual - Zoom Meeting

Attendees

Pete Bardunias, Capital Region Chamber
Peter Comenzo, Town of Rotterdam
Craig Darby, CBRE
John Davidson, DA Collins Companies
Valerie Deane, NYSDOT, Region 1
Lou Esposito, Town of Princetown/OOIDA
Chad Grinnell, Norfolk Southern
Jeffrey Gritsavage, NYS Canal Corporation
Steve Iachetta, Albany International Airport
Mike Izdebski, Plug Power
Gideon Jenkins, CSX
Andrew Kreshik, City of Troy
Mark Landgraf, Citizen
Catherine Lawson, University at Albany
Reema Loutan, US EPA
Jennifer Macdonald, Association of American Railroads
Gautam Mani, FHWA
Kate Maynard, CDRPC
Thomas Morkan, US Maritime Administration North Atlantic Gateway
Sam Morreale, City of Albany
Susan Olsen, NYSDOT, Region 1
Josh Tocci, CDRPC
Emily Traiforos, GoRail
Bill Trudeau, City of Albany
Erik VandenBerg, General Electric
Tony Vasil, Port of Albany
Jeff Wojtowicz, RPI
Adam Yagelski, Town of East Greenbush
Chris Bauer, Capital District Transportation Committee
Jacob Beeman, Capital District Transportation Committee
Andrew Tracy, Capital District Transportation Committee

1. Welcome and Introductions

Chris Bauer began the meeting at 9:00 am with a review of the meeting agenda.

2. Capital Region's Plug Power - Building the Green Hydrogen Economy (Michael J. Izdebski, Supply Chain Systems Manager)

Mike Izdebski gave a presentation highlighting the core business model and products of Plug Power.

The following notes summarize the presentation:

- Plug Power (PP) has been a global leader in hydrogen energy for over 20 years
- PP is the world's largest user of liquid hydrogen
- PP announced the construction of a new gigafactory in Rochester NY, which will be the largest fuel cell manufacturing facility in the world, once completed
- PP offers fuel cell solutions from less than 5kw to multi-megawatt micro grid and datacenter storage and backup
- It is expected that hydrogen will become a primary energy source over the next decade.
    - Estimated 30% of heavy-duty vehicles will run on hydrogen
    - Estimated 18% of the world electricity will be produced using hydrogen
- PP is working on a joint venture with Renault to develop a hydrogen fuel cell van. Pilot expected to be underway in early 2022
- PP is also working on a joint venture with the SK Group of South Korea to accelerate the hydrogen economy in Asian markets

For more information, please see the attached presentation.

<u>FAC Comments / Questions on the presentation:</u>

- Andrew Kreshik – Are residential fuel cells feasible right now?
    - Answer – They are not a focus area for PP at this time.
- Kate Maynard – Do you see hydrogen as a parallel fuel to existing sources?
    - Answer – Yes
- Jacob Beeman – Are there any plans for PP to install public hydrogen fueling infrastructure?
    - Answer – No known plans at this time
- Chris Bauer – Are most goods used in PP's manufacturing process being brought into the region by truck?
    - Answer – Yes
- Steve Iachetta – A few years ago the Airport and CDTA had a pilot program using light-duty hydrogen vehicles and experienced issues in cold weather, have those issues been resolved with the new technology?
    - Answer – Can't speak to the specific issue they were having with their vehicles, but the technology for on-road hydrogen use has come a long way in recent years.

- Pete Bardunias – Is there an opportunity for fuel cells to be used as propulsion for barge vessels?
    - Answer – Yes

3. Traffic Data Collection Services Update (Andrew Tracy, CDTC)

Andrew Tracy from CDTC gave a presentation on the local traffic data collection project that CDTC has recently kicked off.

The following notes summarize the presentation:

- CDTC will be working with a consultant to collect traffic counts at key locations throughout the region
- Counts will likely begin in the spring of 2022
- Some counts will be collected using ATR tube counters and others will use radar technology
- Once the study is complete CDTC will develop a summary of the counts relevant to freight activity in the region

4. Regional Truck Parking Study Status Update (Chris Bauer, CDTC)

Chris Bauer gave a brief update on the upcoming CDTC Regional Truck Parking Study.

The following notes summarize the update:

- Legal counsel has been negotiating contract details over the past few months
- Once the contract has been finalized and approved CDTC and the consultant team will begin work on the study

5. Capital District Clean Communities Update (Jacob Beeman, CDTC)

Jacob Beeman gave a brief overview of CDCC and an update on recent and upcoming events hosted by CDCC.

The following notes summarize the update:

- CDCC is a department of energy sponsored program that works with local public / private vehicle fleets to help them transition to alternative fuels
- NYTVIP provides vouchers, or discounts, to HD vehicle fleets that purchase or lease alternative fuel vehicles, including:
    - all-electric (battery electric or BEV), hydrogen fuel cell electric (FCEV), plug-in hybrid electric (PHEV), conventional hybrid electric (HEV), compressed natural gas (CNG), or propane medium- and heavy-duty vehicles (weight class 3 through 8)
    - To participate in the program and receive the funding applications must scrap a similar diesel that is MY 2009 or older
    - Funding for On-Road trucks is 95% of the incremental cost compared to a comparable diesel vehicle

- For On-Road Trucks – (Class 3-8 vehicles) Funding has been exhausted for all fuel types **except** Battery Electric and Fuel Cell Electric Vehicles
- NYSERDA recently announced a separate pot of money specifically for "Non-Road Port Cargo Handling Equipment"
- Eligible non-road port cargo handling equipment (CHE) operators at eligible New York State port facilities can access voucher incentives for all-new or repowered BEV CHE (e.g., rubber-tired gantry cranes, straddle carriers, shuttle carriers, top loaders, side loaders, skid loader, and terminal tractors including yard hostlers operating within ports).
- Funding for Port vehicles is 90% of the incremental cost compared to a diesel equivalent and capped at $140,000

- Clean Communities Call for Projects
  - CDTC is seeking proposals from municipal and public agency sponsors for transportation planning and alternative fuels planning assistance in the fiscal year beginning April 1, 2022.
  - Funding is available for potential alternative fuel planning activities including but not limited to, existing fleet inventories, alternative fuel transition plans, municipal electric vehicle charging plans, etc.

6.2022-2027 Transportation Improvement Program (TIP) Solicitation Update (Chris Bauer, CDTC)

Chris Bauer gave a brief update on the CDTC TIP solicitation process.

The following notes summarize the update:

- CDTC is currently soliciting for new TIP projects, with an application deadline of December 3, 2021
- Once all applications have been submitted the candidate project list will be shared with the Freight Advisory Committee for their comments
- At this time we are not aware of the implications of the new infrastructure bill

7. Discussion – Member Updates

- Airport – Steve Iachetta, Albany Airport Authority
  - Enplanements are back to 82% of pre-pandemic levels
  - Scheduled cargo freight is up 14% from previous years

- Marine – Tony Vasil, Port of Albany
  - Ships and barges are up 15% and tonnage is up 20%
  - Ports of LA and Long Beach are still experiencing supply chain issues and there are currently 90 ships waiting in the ports
  - They are trying to relieve this pressure by allowing containers to be stacked up to 4 units high compared to 2
  - Issues are due to shortage of trucks, and warehouse space, among other factors

- Port of Albany is looking into starting a container on barge service between the Port of NY / NJ and Port of Albany

- Marine – Thomas Morkan, US Maritime Administration North Atlantic Gateway
  - Thomas noted in the meeting chat that he has recently relived Captain Jeff Flumigan as the Director of Maritime Administrations North Atlantic Gateway Office. If you have any questions regarding MARAD please contact him at Thomas.morkan@dot.gov

- Rail – Gideon Jenkins, CSX
  - Hiring has been ramping up in 2021 Q4
  - CSX has been exploring ways to grow including methods of bringing more goods traditionally moved by truck to rail
  - CSX recently acquired "Quality Carriers" a liquid chemical trucking company
  - CSX's acquisition of Pan Am rail is under STB review; if approved they are looking to do upgrades to facilities, yards, and rails

- Trucking
  - No representative on the call.

- Other Private Industry (Manufacturing, Distribution, Warehousing, etc.)
  - No representative on the call.

- Institutional / Government / Non-profit - Jeff Wojtowicz, RPI
  - RPI is wrapping up their Energy Efficient Logistics grant and is currently seeking pilot projects for improved delivery methods.
  - RPI is also partnering with Volvo on the new Supertruck Program

- Institutional / Government / Non-profit – Chris Bauer, CDTC
  - Chris noted the NY Chapter of Supply Chain Management professionals is restructuring and there may be opportunities for the FAC to coordinate with them on upcoming events

8. Action Items / Next Meeting

2022 Meetings will be held on February 16, May 18, August 17, and November 16.

All meetings will begin at 9:00 AM unless otherwise specified.

9. Adjourn

The meeting was adjourned at approximately 10:07 AM.

CDTC FREIGHT ADVISORY COMMITTEE

CDTC Capital District Transportation Committee

November 17, 2021

Today's Agenda

1. Welcome
2. Capital Region's Plug Power - Building the Green Hydrogen Economy (Michael J. Izdebski, Supply Chain Systems Manager)
3. Traffic Data Collection Services
4. Regional Truck Parking Study Status
5. Clean Cities
6. 2022-2027 Transportation Improvement Program (TIP) Solicitation Update
7. Member Updates
   - i. Airport
   - ii. Marine
   - iii. Rail
   - iv. Trucking
   - v. Other Private Industry (manufacturing, distribution, warehousing, etc.)
   - vi. Institutional/Government/Non-profit

Welcome to Plug Power

Michael J. Izdebski
Supply Chain Systems Manager

November 18, 2021

Legal Disclaimer

This presentation contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995 that involve significant risks and uncertainties about Plug Power Inc. ("PLUG"), including but not limited to statements about PLUG's expectations regarding gross billings for 2021 and 2025 and other financial metrics such as annual sales, gross margins, OPEX leverage and operating income for 2025, including action plans in place to achieve such targets; statements regarding PLUG's outlook, growth, strategies and drivers for growth; PLUG's position and capabilities in hydrogen generation, liquefaction and distribution of green hydrogen fuel, including its ability to generate long-term growth; expectations regarding the acceleration of zero emission sustainable solutions and PLUG's ability to deliver such solutions; expectations regarding the projected timing of green hydrogen plants in the U.S.; expectations regarding the path to 500 TPD by 2025; expectations regarding fuel revenue in 2025; trends regarding service and fuel costs; market penetration growth expectations for fuel cell deployments, stationary power and new markets; expectations regarding the deployment of electrolyzers (MWs) to external customers by 2025; expectations regarding new market applications; expectations regarding the sales pipelines and the expected timing and amount of deliveries; expectations regarding the installation of electrolyzer solutions and the amount of TPD of green hydrogen that will be generated and sold; expectations regarding the amount of operating forklifts in the U.S. and Europe by 2030; expectations regarding PLUG's ability to achieve cost parity with lead acid batteries and its projected market share and projected revenues by 2025 and 2030; expectations regarding the continued growth in material handling and PLUG's ability to further such growth; expectations regarding PLUG's ability to accelerate the adoption of fuel cell applications and decarbonize other industries; and expectations regarding E.U.'s hydrogen network; and expectations regarding Hyvia's customer pilots and the timing of the offering of vehicles in Europe. You are cautioned that such statements should not be read as a guarantee of future performance or results, and will not necessarily be accurate indications of the times that, or by which, such performance or results will have been achieved. Such statements are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in these statements. In particular, the risks and uncertainties include, among other things, the risk that we continue to incur losses and might never achieve or maintain profitability; the risk that our lack of extensive experience in manufacturing and marketing products may impact our ability to manufacture and market products on a profitable and large-scale commercial basis; the risk that unit orders may not ship, be installed and/or converted to revenue, in whole or in part; the risk that a loss of one or more of our major customers, or if one of our major customers delays payment of or is unable to pay its receivables, a material adverse effect could result on our financial condition; the risk that pending orders may not convert to purchase orders, in whole or in part; the cost and timing of developing, marketing and selling our products; the risks of delays in or not completing our product development goals; our ability to achieve the forecasted gross margin on the sale of our products; the cost and availability of fuel and fueling infrastructures for our products; market acceptance of our products and services; our ability to establish and maintain relationships with third parties with respect to product development, manufacturing, distribution and servicing, and the supply of key product components; the cost and availability of components and parts for our products; our ability to develop commercially viable products; our ability to reduce product and manufacturing costs; our ability to successfully market, distribute and service our products and services internationally; our ability to improve system reliability for our products; competitive factors, such as price competition and competition from other traditional and alternative energy companies; the cost of complying with current and future federal, state and international governmental regulations; our subjectivity to legal proceedings and legal compliance; the risks associated with potential future acquisitions; and other risks and uncertainties referenced in our public filings with the Securities and Exchange Commission (the "SEC"). For additional disclosure regarding these and other risks faced by PLUG, see disclosures contained in PLUG's public filings with the SEC, including the "Risk Factors" section of PLUG's Annual Report on Form 10-K for the year ended December 31, 2020 and Quarterly Reports on Form 10-Q for the quarters ended March 31, 2021 and June 30, 2021. You should consider these factors in evaluating the forward-looking statements included in this presentation and not place undue reliance on such statements. The forward-looking statements are made as of the date hereof, and PLUG undertakes no obligation to update such statements as a result of new information.

In addition, the industry and market data contained in this presentation is based either on our management's own estimates or on independent industry publications, reports by market research firms or other published independent sources. Although we believe these sources are reliable, we have not independently verified the information and cannot guarantee its accuracy and completeness, as industry and market data are subject to change and cannot always be verified with complete certainty due to limits on the availability and reliability of raw data, the voluntary nature of the data gathering process and other limitations and uncertainties inherent in any statistical survey of market shares. Accordingly, you should be aware that the industry and market data contained in this presentation, and estimates and beliefs based on such data, may not be reliable. Unless otherwise indicated, all information contained in this presentation concerning our industry in general or any segment thereof, including information regarding our general expectations and market opportunity, is based on management's estimates using internal data, data from industry related publications, consumer research and marketing studies and other externally obtained data. Certain financial or other projections are based on management estimates, currently available information and assumptions that may change. Accordingly, there can be no assurance that we will achieve our projected financial or other expectations. The expectations are inherently subject to significant economic, competitive and other uncertainties and contingencies, many of which are beyond the control of management. Actual results may vary materially based on a number of factors.

Gross billings is based on the invoice value of equipment deployed and services rendered. Invoice value of equipment is measured on a relative basis using cash value within contracts with customers and it is attributed to the period in which the equipment is deployed. To that amount, PLUG adds the invoice value for services rendered in the period. These services include fuel provided, extended warranty contracts serviced, power provided under Power Purchase Agreements, etc. PLUG's objective in presenting gross billings is to present to investors an operating metric that conveys commercial growth over time. Management also uses this operating metric as a measurement of commercial growth, a basis for establishing performance targets and annual budgets, and for making operating decisions. The significant estimates and assumptions underlying the metric include the allocation of revenue, excluding the provision for warrants, based on relative stand along selling prices used in our GAAP revenue numbers.

The Global Leader

in hydrogen energy

Plug Power has been a leader in hydrogen energy for over 20 years.

As the world's most comprehensive hydrogen energy services company, Plug Power has built a global footprint in hydrogen generation, hydrogen supply, services and equipment.

Plug Power is also the worlds largest user of liquid hydrogen and has built more hydrogen refueling stations than anyone in the world.

20 years
of innovation

40,000+
systems in service

180
granted patents

545 million
hours of operation

27 tons
of hydrogen daily

1,100+
employees

Source: company statistics. including GenDrive, GenSure, GenFuel & Giner

The world is shifting to electric power

Economic and environmental mega-trends are driving a transition away from fossil fuels and internal combustion engines.

This will require new forms of energy storage including hydrogen fuel cells.

Key Trends Driving Electric Power

- ✓ reduce dependence on fossil fuels
- ✓ superior performance of electric motors
- ✓ lower cost of operation and maintenance
- ✓ lower total cost of ownership

23^{+} million

electric vehicles annually, 30% of total vehicle sales by 2030

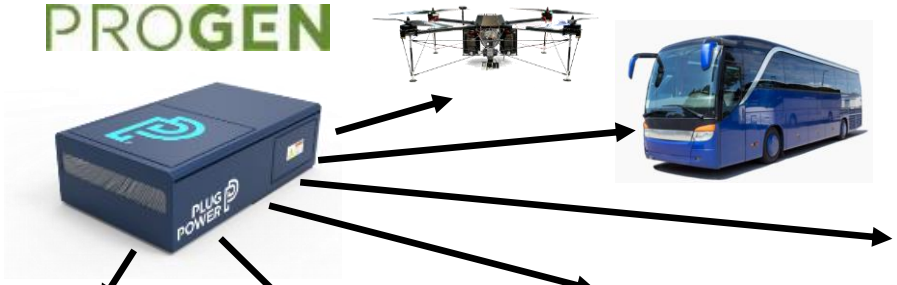
Source :EIA

Turnkey Product Suite

GENKEY

POWER

PROGEN

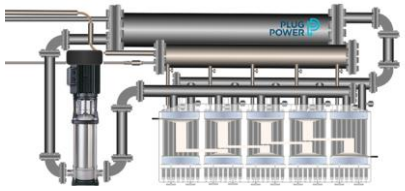


GENDRIVE

GENSURE

FUEL

GENFUEL

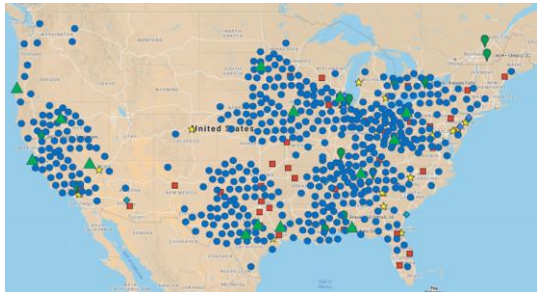


SERVICE

GENCARE

98+% uptime performance

Growing to 500+ Sites by 2024



The Leader in Fuel Cell Technology

Plug Power has been innovating the design and manufacturing of PEM Fuel Cells for over 20 years.

In 2020 the company announced the construction of a new US facility to accelerate the manufacturing of PEM fuel cells at Gigawatt capacity.

Plug Power's Gigafactory will be the largest fuel cell manufacturing facility in the world when it enters production in 2021

The Leader In Fuel Cell Platforms

A full range of solutions from <5KW to multi-megawatt

EPOD	< 5 kW		Drones UAVs
GenDrive / ProGen	10 – 30 kW		Robotics and Material Handling Equipment Airport Ground Support Equipment
ProGen	30 – 60 kW		Class 3-5 Trucks Buses
ProGen	100 - 250 kW		Class 4-8 Trucks Full-size Buses & Class V Forklifts
ProGen Systems	100 kW to multi-megawatt		Microgrid and Storage Data Center Backup

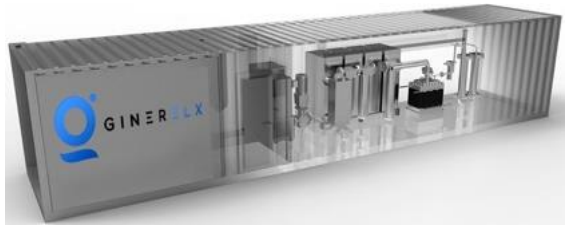
The Leader In

Hydrogen Energy Services

Plug Power is the world's most comprehensive hydrogen energy services provider.

Our 2020 acquisitions of Giner ELX and United Hydrogen expanded our product capabilities and positioned Plug to transition from low carbon to zero carbon hydrogen solutions.

Our vertical integration strategy positions the company as the global leader in generation, liquefication, distribution and dispensing of hydrogen.



Plug Electrolyzers

Generating green hydrogen through electrolysis for local or regional applications

Plug Hydrogen

National distribution of liquid hydrogen to end users to ensure constant supply

GenFuel Supply

Turn-key service that provides reliable hydrogen distribution and supply

GenCare Services

Fully monitoring service network for real-time fault detection and ensured uptime

Hydrogen is projected to be the energy source of the next decade

With better operational performance, a lower total cost of ownership and the ability to significantly reduce carbon footprint, hydrogen and fuel cells are projected to demonstrate significant growth in the coming decades.

By 2030

30%

of heavy-duty vehicles will run on hydrogen

2M Vehicles

300k Trucks

will be equipped with fuel cell technology

By 2050

18%

of the world's energy will be produced using hydrogen

Source :The Hydrogen Council

2025 Green Hydrogen Plants

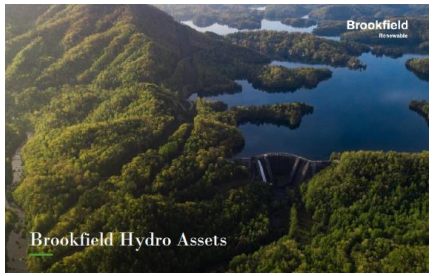
10+

US Green Hydrogen Plants
Europe Discussions in Progress

500TPD

of Green Hydrogen with
Low-Cost Renewables and Plug Power Electrolyzers

Developed with Partners



Green Hydrogen Pipeline

LH2
Operational

★
Pipeline

⚡
Project Commenced[1]

[1]Project Commenced:Term Sheets/MOU's Signed, Estimated Go Live 2022-2025

What we expect Plug to look like in 2025?

$3B
in Annual Sales

30%+
Gross Margin

17%+
Operating Income

A Global Hydrogen Ecosystem Market Maker Poised for Continued Substantial Growth

Diversified Technology Company

Global Hydrogen Solution Platform

Generating Significant Earnings & Cash Flows

Differentiated Market Position in Large Global Markets

“The Future”:


H2 TECH
new hydrogen mobility
HYVIA
RENAULT
MASTER H2TECH
HYDROGEN
FUEL CELL
RENAULT MASTER

HYVIA: THE NEW HYDROGEN PATH

PLUG POWER + GROUPE RENAULT

Joint Venture for turnkey hydrogen mobility solutions

Plug Power's ProGen Engine Technology

Renault LCV Platforms (large, medium, and small van platforms)

Units on road 4Q 2021

Customer Pilots expected Q1, Q2 2022

Based on the **Renault Master** platform

On road in Europe expected by end of 2021

MASTER VAN H2-TECH

The goods transport vehicle (12 m3) for professionals, with a range of up to 600 km.

MASTER CHASSIS CAB H2-TECH

The goods transport vehicle (19 m3) for professionals, with a range of up to 250 km.

MASTER CITY BUS H2-TECH

The vehicle for transporting people up to 15 passengers, with a range of 300km.

FUEL CELLS

Reliable and safe 30kW fuel cells, which have proven their worth.

GREEN HYDROGEN CHARGING STATIONS

The distribution of green hydrogen as close as possible to our customers' needs, simple and secure.

PRODUCTION AND STORAGE OF GREEN HYDROGEN

Electrolysers and storage stations for the needs of our customers.

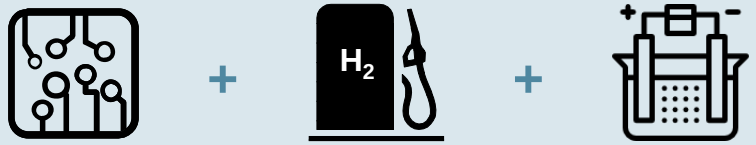
Plug Power and SK Group Form Strategic Partnership to Accelerate Growth of Hydrogen Economy in Asian Markets (1)

- ✓ On January 6th, 2021, Plug Power and SK Group announced plans to form a strategic partnership and joint venture
- ✓ The partnership includes a $1.5Bn strategic investment from SK Group into Plug Power
- ✓ SK Group is one of the leading South Korean conglomerates with a significant presence throughout Asia's energy industry
- ✓ The partnership looks to leverage SK's leadership in chemicals, petroleum and energy as well as Plug's leading hydrogen platform
- ✓ Together, the companies look to accelerate the growth of the hydrogen economy and establish a foothold in the rapidly growing Asian markets

South Korean Government's 2040 Targets (2)

- **6MM+** hydrogen fuel cell vehicles
- **1,200** hydrogen refueling stations
- **15,000 MW** stationary hydrogen fuel cell capacity
- **5MM+** tons of hydrogen produced per year
- **~US$40Bn** cumulative economic value

Partnership Target Areas



Fuel Cells Systems + **Fueling Infrastructure** + **Electrolyzers + Green Hydrogen**

Notes:
1. Strategic equity investment is expected to close in the first quarter of 2021.
2. Based on South Korea Ministry of Trade Industry and Energy, Hydrogen Economy Roadmap, published in January 2019.

Plug Power

Thank you

Corporate HQ
968 Albany Shaker Rd
Latham, NY 12110

2. Capital Region's Plug Power - Building the Green Hydrogen Economy

Michael J. Izdebski

Plug Power, Supply Chain Systems Manager

https://www.plugpower.com/

3. Traffic Data Collection Services- Update

Andrew Tracy, CDTC

4. Regional Truck Parking Study - Update

- Contracting process ongoing
- Next Steps: **Convene Study Advisory Committee**
- Regular updates at Freight Advisory Committee meetings

5. Clean Cities- Update

Jacob Beeman, CDTC

6. TIP Solicitation

- Transportation Improvement Program (TIP) – a fiscally constrained list of the next 5 years of transportation projects
- Applications due December 3rd
- Process:
  - *Eligible project sponsors* submit candidate projects
  - Staff evaluation and scoring
    - Benefit/Cost ratio and Merit Score (inc. Freight)
  - Planning Committee makes project recommendations to the Policy Board > Policy Board officially approves
- Comments are welcome and encouraged

6. TIP Solicitation

- Candidate project list will be shared with FAC
  - Comments are welcome and encouraged
- Impact of Infrastructure Investment and Jobs Act not yet known

7. Member Updates

i. Airport
ii. Marine
iii. Rail
iv. Trucking
v. Other Private Industry (manufacturing, distribution, warehousing, etc.)
vi. Institutional/Government/Non-profit

8. Next Meeting – February 16, 2022

- 2022 Freight Advisory Committee Dates
  - February 16
  - May 18
  - August 17
  - November 16
- Hybrid meetings?
- Save the Date coming

Thank you for attending!

Christian P. Bauer, AICP
Senior Transportation Planner
Capital District Transportation Committee
(518) 458-2161
cbauer@cdtcmpo.org

Have a Happy and Healthy Holiday Season! See you in 2022