

Section 1: Overall Project Summary and Approach

a. Description of GHG Measures

The Hog Lick Hydrogen (H₂) Facility (HLH₂ Facility) will produce green H₂ that will fuel heavy-/medium-duty (HD/MD) buses, trucks, and construction vehicles that will replace diesel vehicles currently in operation in Marion and Harrison Counties, West Virginia. The implementation of the HLH₂ Facility and the use of H₂ fueled vehicles will reduce greenhouse gas (GHG) emissions by eliminating diesel fuel consumption in support of the West Virginia PCAP. In addition, the HLH₂ Facility will produce green H₂ on-site, eliminating the GHG emissions that would be generated by diesel fueled trucks transporting either diesel or H₂ to the HLH₂ Facility.

The HLH₂ Facility will produce green H₂ using a solar farm to generate electricity that will power a H₂ electrolyzer. The electrolyzer separates water (H₂O) into hydrogen (H₂) and oxygen (O₂) without emitting CO₂. The green H₂ produced by the HLH₂ Facility will fuel Marion and Harrison County school buses, public transport vehicles, and service fleets that will be purchased as part of the project scope.

The HLH₂ Facility will be strategically located adjacent to the H₂ refueling and servicing depot (CFS Depot) being developed by Hog Lick Aggregates as part of the US DOE funded Appalachian Regional Clean Hydrogen Hub (ARCH2). The HLH₂ Facility will use the storage and refueling capacity of the adjacent CFS Depot to refuel H₂ trucks and buses owned and operated by Marion and Harrison Counties. Co-locating the HLH₂ Facility adjacent to the CFS Depot eliminates H₂ trucking costs and the associated GHG emissions and minimizes H₂ losses during the distribution process. The HLH₂ Facility together with the CFS Depot and the H₂ fueled vehicles is a self-contained replicable system that will serve as a model for other counties and states seeking to eliminate GHG emissions from transportation operations. The key components of the HLH₂ Facility include:

- Constructing a 7MW solar farm on a southern facing site adjacent to the CFS Depot.
- Installing a battery energy storage system to levelize energy delivery.
- Installing an electrolyzer to produce 129,608 kg/yr of H₂ at the site.
- Replacing up to 30 diesel school buses, transit buses, construction trucks, and service vehicles currently in operation with H₂ fueled vehicles to eliminate GHG emissions.
- Contracting with the CFS Depot to use excess capacity to refuel and service the county school buses, transit buses, and HD/MD trucks.
- Facilitating the training of H₂ mechanics and commercial drivers (CDL) to support the maintenance and operation of H₂ vehicles.
- Demonstrating that the "total cost of ownership" (TCO) for H₂ vehicles is lower than that of equivalent diesel vehicles.
- Incentivizing other counties, state agencies, and private fleet operators to transition to HD/MD H₂ vehicles.

Marion County has chosen H₂ as the optimal fuel solution to minimize the performance risk of its clean energy transportation fleet given the limitations of battery electric vehicles in terms of range, payload, and performance in cold temperatures. The risk analysis of the HLH₂ Depot provided below summarizes key aspects of the project that have the potential to cause a cost over-run, schedule delay, poor performance, or negative impacts on the local community.

- Technology Risk: The "Technology Readiness Assessment" (TRA) (ref. US Government Accountability Office) is used to provide the "Technology Readiness Level" (TRL) for each project component, where a TRL rating of 9 is given to commercially available technology and a TRL rating of 1 is given to applied research.
 - Solar Farm: TRL = 9. There are many capable suppliers, but the high demand for solar panels may require partial payment on order placement.

- H₂ Electrolyzer: TRL = 9. There are many capable suppliers and equipment pricing is competitive. Vendors have indicated that an eight-month lead time is required.
- H₂ Cell Engine Technology: TRL = 9. Nikola began commercial production of H₂ fuel cell trucks in September of 2023 at their facility in Phoenix, AZ. To date, Nikola has produced and delivered over 50 Class 8 trucks to customers in the USA.
- H₂ Internal Combustion Engine (ICE) Technology: TRL = 8. Cummins is scheduled to announce the commercial availability of its H₂ ICE technology in early 2025. Demonstration versions of the H₂ ICE are currently in testing.
- Environmental Risk: The production of green H₂ does not produce GHG emissions and there is no wastewater discharge. The planned location for the facility is clear land and a Phase I Environmental Assessment has been completed for the site. There will be some noise impact resulting from the movement of HD/MD vehicles and most activity will be during working hours. All equipment is low profile - no more than 15 ft in height and planting will be provided to mitigate visual impact of the HLH₂ Facility. There is limited potential for environmental risk to impact the timing and amount of GHG emission reduction.
- Project Management and Construction Risk: Marion County will engage the West Virginia Region VI Planning and Development Council (WV Region VI) to administer the CPRG funds due to their extensive grant management experience. In addition, Marion County will contract with a qualified engineering firm to manage and coordinate the permitting, purchasing, and construction activities. There is limited engineering and design required for the HLH₂ Facility as all components will be manufactured off-site. The solar panels will be ground mounted units with limited foundation requirements. The battery electric storage system (BESS) and electrolyzer will be skid-mounted units that will arrive at the site pre-assembled and connection-ready.
- Equipment and Vehicle Supply Risk: Suppliers such as Nikola, Hyzon, Cummins are ramping up commercial production of HD/MD H₂ fuel cell vehicles. However, limited production capacity has the potential to delay the availability of buses and trucks to meet the planned project schedule. If such vehicle supply delay occurs, it would delay the timing of GHG emission reduction. Marion County will engage a qualified consultant through a competitive bidding process to assist in specifying and selecting the HD/MD H₂ vehicles. Additionally, Marion County will engage a qualified consultant to advise on the H₂ vehicle specifications and selection.
- Offtake Risk: If the solar farm and electrolyzer are completed and producing H₂, but there is a delay in the availability of H₂ powered vehicles, then CFS has agreed to resell the H₂ in the general industrial market or purchase the H₂ for its own use. If the solar farm is producing electricity, but the electrolyzer is not operational, the electricity produced by the solar farm will be sold to the local utility MonPower/FirstEnergy. In the absence of the H₂ vehicles, the GHG emission reductions would be calculated based on how and where the H₂ or electricity was used.
- Operational Risk: Marion County will enter into a performance-based market-competitive agreement (O&M Agreement) with a qualified operator (Facility Operator) to operate and maintain the HLH₂ Facility and to maintain and service the H₂ vehicles. The performance-based fee under the O&M Agreement will be determined by the actual GHG emissions reduction achieved. The Facility Operator will hire, train, and manage the resources required to operate and maintain the HLH₂ Facility to achieve the stated GHG emissions reduction. The counties intend to enter into a service agreement with the CFS to use the refueling capacity of the CFS Depot to refuel the county-owned H₂ trucks and buses.
- H₂ Vehicle Maintenance Risk: The HLH₂ Facility will enter into an H₂ vehicle maintenance and service agreement with the co-located CFS Depot. The design of CFS Depot will include maintenance facilities and vendor-trained maintenance personnel. This arrangement will provide

a tremendous cost savings for the HLH₂ Facility and will leverage the public/private made in the CFS Depot.

The risk assessment described above does not identify any significant risks that could impact the estimated GHG emissions reduction. The timing for the manufacture and delivery of the HD/MD vehicles is one aspect of the project that may delay, but not eliminate or reduce the GHG emission reduction from the project.

The use of clean H₂ in accordance with West Virginia's Pollution Control Action Plan (PCAP) is a pivotal strategy to reduce GHG emissions in the HD/MD transportation sector. While battery electric vehicles (BEVs) offer a solution for reducing GHG emissions in the light-duty and select medium-duty transportation segments, H₂ internal combustion engines (ICEs) and H₂ fuel cell electric vehicles (FCEVs) provide a more cost-effective solution for HD/MD transportation, due to weight and distance limitations in BEV operation. Specifically, BEVs have limited use in heavy-haul applications such as aggregate, logging, and cement due to the substantial weight of the battery, which restricts cargo carrying capacity. Similarly, BEVs face range limitations in long-haul interstate transport, as the longer periods required for battery recharging increases total transportation time.

Applicant and Subrecipients

Marion County, acting through the Marion County Commission, is the Lead Applicant. Marion will own the HLH₂ Facility and H₂ trucks and buses for use in its fleet operations. Marion will employ a Project Manager and hire a consultant to coordinate the Subrecipients and Contractors involved in the HLH₂ Facility and implement a community outreach program for Marion County residents. In working with subrecipients and contractors, Marion will:

- Arrange for the West Virginia Region VI Planning and Development Council (Region VI PDC) to be a subrecipient that will administer the CPRG implementation funding.
- Coordinate with Harrison County in allocating H₂ trucks and buses to be used in road construction, public transport, and student transport, and implementing a community outreach program.
- Enter into a performance based market competitive agreement with Clean Fuel Services LLC (CFS) to operate and maintain the HLH₂ Facility and to refuel and service the H₂ vehicles owned by Marion County.

Harrison County is a Subrecipient. Harrison will receive H₂ trucks and buses for use in its fleet operations and will assist with the community outreach efforts to Harrison County residents. Harrison is less than 5 miles from the HLH₂ Facility and H₂ vehicles will have easy access to the HLH₂ Facility for H₂ vehicle refueling and servicing. Harrison will enter into a performance based market competitive agreement with CFS to refuel and service the H₂ vehicles owned by Harrison County.

West Virginia Region VI Planning and Development Council (Region VI PDC) is a subrecipient. Region VI PDC will receive funding in exchange for providing grant administration services for the HLH₂ Facility. Region VI PDC has extensive experience managing federal grants and serves as the clearing house for federal funding in the six-county Region VI. Region VI will also identify opportunities to replicate the HLH₂ Facility in other counties in the region and the state.

Support of the West Virginia PEAP and PCAP

The "West Virginia Priority Energy Action Plan (PEAP) Report Submitted for the Phase I Report of the Climate Pollution Reduction Grant Program - Grant Number 95330601" (WV PCAP) makes specific

reference to the GHG Reduction Measures that will be implemented by the HLH2 Facility. As indicated in the following letter, the West Virginia Economic Development Agency (the parent agency for the West Virginia Energy Office) strongly supports the HLH₂ Facility.



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EPA Clean Power and Resilience Grid (CPRG) Committee

Dear Members of the EPA CPRG:

I am writing on behalf of The West Virginia Department of Economic Development to express our endorsement of Marion County's hydrogen transportation project (CFS H2 Facility) to be awarded Tier D CPRG implementation funding. The CFS H2 Facility includes the construction of a green hydrogen production facility and the purchase of road construction vehicles and buses to be used by Marion and Harrison Counties in West Virginia. This project provides an innovative and replicable approach to reducing Greenhouse gas (GHG) emissions from vehicle miles traveled (VMT) within the state.

The CPRG implementation funding is crucial for the successful implementation of innovative solutions like the CFS H2 Facility that will help decarbonize the heavy-/medium-duty transportation sector. By transitioning to hydrogen-fueled school buses, Marion and Harrison Counties can reduce their carbon footprint and improve air quality for residents, particularly in areas where children are most vulnerable to the harmful effects of pollution.

Transportation activities accounted for the largest share (29%) of total U.S. greenhouse gas (GHG) emissions in 2021, with CO₂ emissions from transportation increasing by 10% from 1990 to 2021. This is a nationwide concern, and West Virginia is no exception with the transportation sector being the third largest contributor to GHG emissions in the state.

The strategies outlined in the West Virginia Priority Energy Action Plan (WV PCAP) for the Transportation Sector are integral components of West Virginia's broader Carbon Reduction Strategy (WVCRS), which aligns with federal requirements and guidance to curb carbon emissions from transportation. The CFS H2 Facility will be co-located with a hydrogen refueling and servicing depot that is being developed as part of the Department of Energy funded Appalachian Regional Clean Hydrogen Hub (ARCH2). Co-locating the projects will provide cost savings and improve operating efficiencies in leveraging the region's resources to produce and use clean hydrogen and eliminate GHG emissions.

The WV PCAP emphasizes reducing the GHG impacts of the State's transportation network through low/zero carbon emission road construction equipment, sustainable pavement practices, and energy efficient streetlights. Furthermore, the WV PCAP advocates promoting the use of alternative fuel vehicles by incentivizing lower carbon vehicle types and building charging stations for electric vehicles, further reducing the carbon emissions from VMT. By adopting the use of hydrogen fueled vehicles, the CFS H2 Facility will contribute to reducing GHG emissions from VMT that amounted to 13.7 million metric tons of CO₂ equivalent in 2021.

The West Virginia Department of Economic Development wholeheartedly supports the CFS H₂ Facility to create a healthier and safer environment for all West Virginians with special consideration given to Marion and Harrison Counties. Thank you for considering this important project for an award of Tier D CPRG implementation funding.

Sincerely,



Michael R. Graney
Executive Director

Page 39 of the West Virginia PCAP lists the following strategies for reducing GHG emissions in the Transportation Sector:

1. **“Make improvements of the GHG impacts of the State’s transportation network through low/zero carbon emission road construction equipment, sustainable pavement practices, and energy efficient streetlights.”**
The H₂ vehicles in the HLH₂ Facility fleet will include county owned tri-axle trucks and heavy-haul service vehicles and other equipment used in constructing and maintaining West Virginia highways and county roads.
2. **“Incorporate the use of alternative fuel vehicles by incentivizing lower carbon vehicle types and building charging stations for electric vehicles, further reducing the carbon emissions from vehicle miles traveled (VMT).”**
The availability of a Marion County owned H₂ supply and county owned H₂ vehicles will demonstrate the measurable GHG emission reductions that will occur with the adoption of alternative fuel vehicles. The HLH₂ Facility will provide a replicable roadmap that will incentivize other counties and state agencies to convert their existing diesel fleets to alternative fuel vehicles to reduce GHG emissions for VMT.

In addition to implementing the strategies set forth in the WV PCAP to achieve significant GHG emission reductions by 2030 and beyond, the HLH₂ Facility will enable West Virginia to achieve the following goals:

1. Demonstrate substantial reductions of criteria air pollutants (CAPs) and hazardous air pollutants (HAPs) in the low- income and disadvantaged communities in Marion and Harrison Counties.
2. Complement funding provided by the Dept of Energy provided to ARCH2 to develop the CFS Depot as enabling infrastructure to develop and grow a H₂ economy in Appalachia that will maximize GHG reductions and community benefits.
3. Provide a working model to replicate the HLH₂ Facility in multiple counties and scale up the use of alternative fuel vehicles across the state. Co-locating the county-owned HLH₂ Facility with the CFS Depot is an innovative way to leverage the private + DOE grant funding in order to provide a direct benefit to the local community. Similar arrangements can easily be replicated across

multiple jurisdictions. This approach will create economies of scale while increasing energy and resource efficiency.

b. Demonstration of Funding Need

Without the addition of CPRG implementation funding the HLH₂ Facility will not proceed. Marion County does not have the available capital to make a significant transformative investment in alternative fueled vehicles and the development of a county owned H₂ production facility.

The green H₂ production technology and H₂ vehicle technology used in the HLH₂ Facility is commercially available, but requires upfront investment to create economies of scale that will lower cost. Federal and state grants are critical to provide this initial funding support for implementing GHG reduction projects such as implementing H₂ fueling infrastructure and transitioning to H₂ vehicles.

Marion County has cooperated with Hog Lick Aggregates LLC, an affiliate of CFS, in applying for a number of Dept of Energy grants for clean energy and H₂ production, but these grant applications have not been successful. Concept Papers were submitted for the following Department of Energy Funding Opportunity Announcements (FOA):

- DE-FOA-0003213: Hydrogen and Fuel Cell Technologies Office FOA to Advance the National Clean Hydrogen Strategy
- DE-FOA-0002936: Industrial Decarbonization and Emissions Reduction Demonstration-to-Deployment Funding Opportunity Announcement
- DE-FOA-0002970: Bipartisan Infrastructure Law: Energy Improvement in Rural or Remote Areas
- DE-FOA-0003045: Bipartisan Infrastructure Law: Energy Improvement in Rural or Remote Areas (ERA) Fixed Award Grant Program

While these applications were not selected by the Department of Energy, the application process has enabled Marion County to develop and focus their efforts on the HLH₂ Facility as a viable and replicable project that meets the objectives set forth in the WV PCAP.

Tax incentives are another valuable resource for incentivizing investment in GHG reduction measures. Tax credits and/or deductions for purchasing alternative fuel vehicles or installing renewable energy infrastructure, can offset project costs and improve the overall economic feasibility of transitioning to cleaner technologies. However, the effectiveness of tax incentives depends on various factors, including the specific eligibility criteria, the duration of the incentives, and the tax liabilities of the entities involved.

As an example, Marion County does not pay federal income tax and cannot monetize the available tax credits listed above. Therefore, Marion is evaluating sale/leaseback arrangements and partnership structures that may enable Marion to monetize the available tax incentives in accordance with applicable regulations and guidance. Specifically, Marion County is exploring structures through which the project can make use of the following tax incentives:

- Federal tax credits are available through the Inflation Reduction Act (IRA), including:
 - Alternative Fuel Refueling Property Tax Credit (30C) - \$100k per property.
 - Qualified Commercial Clean Vehicles Tax Credit (45W) - \$40k per vehicle.
- US Treasury Section 45V tax credit that will provide:
 - \$3/kg (approx. \$3/gal) subsidy for producing “green H₂” that will reduce the cost of green H₂ to be competitive with diesel.
 - Co-locating the solar farm and the electrolyzer ensures that the HLH₂ Facility will meet the most stringent requirements to qualify for the Section 45V credit in terms of the source and the timing of energy production and delivery

Though it is not directly contributing capital to the development of the project, Marion County is undertaking \$1.8mm of infrastructure upgrades to ensure the success of the HLH₂ Facility. Marion County

and the West Virginia Department of Highways are undertaking a \$1.8mm project to upgrade the 0.8 mile access road that will connect the HLH₂ Facility to State Rt. 73 in a safe and efficient manner for the local community.

While other funding sources, such as public-private partnerships, can offer additional avenues for securing capital, they may also come with their own set of challenges and limitations. For example, private investors may be hesitant to commit significant capital to projects with uncertain returns or long payback periods, particularly in emerging industries like H₂ fuel cell vehicles. To address this issue, Marion County created a Tax Increment Financing (TIF) district for the area surrounding the HLH₂ Facility. The TIF will enable Marion County to secure low cost financing for additional infrastructure upgrades as the HLH₂ Facility expands and attracts new businesses to the area.

c. Transformative Impact

The HLH₂ Facility will not only reduce GHG emissions but also foster innovation, enhance operational efficiency, and bolster the sustainability of its transportation sector, thus contributing to the overarching objectives outlined in the PCAP. The HLH₂ Facility will have several transformative impacts that will lead to significant additional GHG emission reductions.

1. Pioneering, Replicable, and Scalable Policies or Programs to Increase the Deployment of GHG Emission Reduction Technologies:

Implementing H₂ fuel cell and H₂ internal combustion engine technology in the HD/MD transportation sector has significant potential to be expanded and scaled. The success of the HLH₂ Facility in adopting H₂ technology will provide a “transition road map” that can be replicated in other counties and cities in West Virginia and across the country. Post completion evaluation of the HLH₂ Facility will inform the development of policies and programs that will facilitate the widespread adoption of H₂ powered vehicles.

The lack of availability of H₂ vehicle refueling and infrastructure remains a critical shortfall that limits the widespread adoption of H₂ in the transportation sector. The HLH₂ Facility will provide a replicable model for developing this infrastructure and enable West Virginia to establish a comprehensive network of H₂ production facilities and refueling and servicing depots that will be integrated with and support the ARCH2 projects currently underway in the region.

2. GHG Emission Reductions from Hard-to-Abate Sectors:

The HLH₂ Facility is focused on HD/MD transportation, which includes heavy-haul applications like aggregate, logging, and long-distance interstate trucking. Compared to light-duty and passenger vehicles, there has been a lower adoption of H₂ use as fuel in HD/MD transportation as fleet owners continue to rely heavily on diesel-powered trucks and buses. Introducing H₂ as a viable alternative fuel for the HD/MD transportation sector will give fleet operators with a cost effective alternative to diesel and will create emissions reduction in HD/MD transportation sector where GHG reduction measures have been limited.

3. Market Transformations that Accelerate the Deployment and Adoption of GHG Emission Reduction Technologies

The introduction of H₂ fuel cell technology in the transportation sector will accelerate the deployment and market adoption of emerging GHG emission reduction technologies. As the demand for H₂ powered vehicles increases, economies of scale and technological advancements will drive down costs and improve performance, making H₂ a more competitive option in the transportation sector. This market transformation not only benefits the environment but also stimulates economic

growth and job creation in industries related to H₂ production, distribution, and infrastructure development.

Transitioning to H₂ vehicles will be a significant shift for both the public and private sectors and will require sustainable and cost effective transportation solutions. Forecasts by the National Renewable Energy Laboratory (NREL) suggest that by 2030, the total cost of ownership for an H₂ FCEV truck will be equal to that of a traditional diesel truck, presenting a compelling economic argument for widespread adoption. However, this cost parity will not occur unless there are strategic investments from the federal and state governments in the infrastructure required to increase H₂ availability while simultaneously driving down its cost.

Section 2: Impact of GHG Reduction Measures

a. Magnitude of GHG Reductions from 2025 through 2030

The implementation of the HLH₂ Facility will result in cumulative GHG emissions reduction of **9,574 mtCO₂e from 2025 through 2030**. The emission reduction will be achieved by implementing three measures:

- **Measure #1:** Replace diesel fueled HD/MD vehicles with equivalent H₂ fueled vehicles to be owned by Marion and Harrison Counties (**9,276 mtCO₂e eliminated 2025-2030**).
- **Measure #2:** Eliminate the need to transport diesel fuel from the supply terminal in Newell, WV to refueling depots in Marion and Harrison Counties (**45 mtCO₂e eliminated 2025-2030**).
- **Measure #3:** Sell any surplus hydrogen produced by the HLH₂ Facility and not used for county vehicles to CFS for use in fueling hydrogen trucks purchased by CFS under the scope of the DOE funded ARCH2 project (**253 mtCO₂e eliminated 2025-2030**).

Measure #1: GHG Emission Reduction by Replacing Diesel HD/MD Vehicles with Hydrogen Vehicles

GHG emissions reductions from Measure #1 will be achieved by replacing diesel fueled trucks and buses currently used in Marion and Harrison Counties with H₂ fueled vehicles. The key assumptions for the 30 existing diesel vehicles used in Marion and Harrison Counties and the 30 new H₂ vehicles that will replace them are provided in the Technical Appendix.

The GHG emission reduction from replacing diesel vehicles with H₂ vehicles was calculated by first defining the vehicle fleet mix to be replaced. This decision was based on discussions with public works departments, school bus fleet managers, and public transit departments in both Marion and Harrison Counties. In addition, a base case operating scenario was developed for each vehicle type in order to calculate the vehicle miles traveled (VMT) over a typical year. Table 1 below presents the calculation showing a total of **1,546 (mtCO₂e/yr)** of GHG emissions is generated from the assumed fleet mix and base case operating scenario considering the following assumptions: 30 vehicles including school buses, transit buses, service trucks, and heavy-haul vehicles.

- Typical driving mileage and fuel efficiency based on discussion with Marion and Harrison Counties and standard industry metrics.
- 20 days per month of operation for each vehicle (Mon - Friday).
- GHG emissions per gallon of diesel used equal to 10.21 (kg CO₂e / gal) (per US DOE).

Diesel Use and GHG Emissions From Operation of County Trucks						
Diesel Use Reduction from County Trucks	Vehicle Info	# of Vehicles	VMT/day	Diesel (gal/day)	Diesel (gal/mo)	Diesel (gal/yr)
Clarksburg Public Works Department	Heavy Haul Truck	2	80	32	640	7,680
Fairmont City Public Works Department	Heavy Haul Truck	2	80	32	640	7,680
White Hall PSD	Tri Axle Truck	2	100	50	1000	12,000
Fairmont City Public Works	Tri Axle Truck	2	100	50	1000	12,000
Tri County Water Association	Service Truck	2	85	28	567	6,800
Harrison County Public Schools	School Bus	8	100	114	2286	27,429
Marion County Public Schools	School Bus	8	100	114	2286	27,429
Fairmont-Marion County Transit Auth.	Transit Bus	2	150	60	1800	21,600
Mountain Line Transit Authority	Transit Bus	2	200	80	2400	28,800
TOTAL		30	995	561	12,618	151,417
Note: VMT = vehicle miles traveled						
GHG Emissions Red. from County Trucks	Vehicle Info	# of Vehicles	VMT/day	CO ₂ e (kg/day)	CO ₂ e (kg/mo)	CO ₂ e (kg/yr)
Clarksburg Public Works Department	Heavy Haul Truck	2	80	327	6,534	78,413
Fairmont City Public Works Department	Heavy Haul Truck	2	80	327	6,534	78,413
White Hall PSD	Tri Axle Truck	2	100	511	10,210	122,520
Fairmont City Public Works	Tri Axle Truck	2	100	511	10,210	122,520
Tri County Water Association	Service Truck	2	85	289	5,786	69,428
Harrison County Public Schools	School Bus	8	100	1167	23,337	280,046
Marion County Public Schools	School Bus	8	100	1167	23,337	280,046
Fairmont-Marion County Transit Auth.	Transit Bus	2	150	613	18,378	220,536
Mountain Line Transit Authority	Transit Bus	2	200	817	24,504	294,048
TOTAL		30	995	5,727	128,831	1,545,969
Note: VMT = vehicle miles traveled			CO ₂ e (mt/day) =>	5.73	CO ₂ e (mt/yr) =>	1,546.0

Table 1. Measure #1: GHG Emissions Generated by Diesel Truck Fleet

The HLH₂ Facility will use H₂ fuel cell electric vehicles (FCEVs) to replace existing diesel vehicles. FCEVs produce water as a byproduct of combustion without any GHG emissions. Therefore, the total **1,546 (mtCO₂e/yr)** of GHG generated by the existing diesel fleet (shown in Table 1) will be eliminated when those vehicles are replaced with their H₂ fueled equivalents. This reduction would occur each year during the 2025 - 2030 time frame assuming that the fleet mix and base case operating scenarios are the same each year. Further analysis would be required if the HLH₂ Facility were to vary the operating scenario, modify the fleet mix, or use H₂ internal combustion engine (ICE) technology instead of fuel cell technology, as H₂ ICE technology generates nitrogen oxides (NOx).

Measure #2 Eliminate the Emissions Resulting from the Transport/Delivery of Diesel Fuel

GHG emissions reductions from Measure #2 will be achieved by eliminating the need to transport diesel fuel from the Ergon Fuel Terminal in Newell, WV to the vehicle refueling depots in Marion and Harrison Counties. Elimination of the diesel fuel delivery would eliminate **7.42 (mtCO₂e/yr)** of GHG emissions generated by the diesel delivery tanker. This reduction would occur each year during the 2025 - 2030 time frame assuming that the fleet mix and base case operating scenarios were the same each year.

Table 3 below presents the calculation for the Measure #2 GHG emission reductions based on the following assumptions:

- 151,417 gallons/year of diesel fuel delivered to Marion and Harrison Counties for their fleet of diesel vehicles comprising the HLH₂ Facility fleet (see Table 2).
- A diesel tanker truck will need to deliver 10,000 gallons of diesel per load (resulting in 16 trips per year).
- Each round trip is 240 miles (based on Google maps between Newell, WV and Marion County).
- Diesel tanker has a fuel use of 5 miles per gallon resulting in the diesel tanker using 727 gal/yr of fuel to complete the deliveries.

- GHG emissions base on a diesel fuel emission factor of 10.21 kg CO₂e/gal (per US EPA)

Diesel Use and GHG Emissions From Fuel Delivery to County Trucks						
Diesel Use Reduction from not Delivering Diesel to County Trucks	Fuel Delivered (gal/yr)	Fuel Truck Capacity (gal)	Fuel Deliveries (trips/yr)	Roundtrip Distance	Diesel Use for Delivery (mi/gal)	Diesel Use for Delivery (gal/yr)
Location of Fuel Sourcing Depot: Ergon Fuel Terminal Newell, WV	151,417	10,000	15	240	5.0	727
GHG Emissions Reduction from not Delivering Diesel to County Trucks	Diesel Use for Delivery (gal/yr)	CO ₂ e (kg/gal)	CO ₂ e (kg/yr)	CO ₂ e (mt/yr)		
Ergon Fuel Terminal Newell, WV	727	10.21	7,421	7.42		

Table 2. Measure #2: GHG Emissions Generated by Diesel Fuel Delivery

Measure #3: Sell Surplus Hydrogen for Use in Hydrogen Trucks Purchased by CFS as Part of ARCH2 Scope

The components of the HLH₂ Facility are designed so that the amount of green H₂ produced will match the H₂ use requirements of the county-owned vehicles. As calculated the Energy Balance presented in the Technical Appendix the expected H₂ production of the HLH₂ Facility (129,608 kg/yr) closely matches the expected H₂ use by the county-owned vehicles (126,181 kg/yr), resulting in a small surplus of only (3,427 kg/yr).

In the event there is a surplus of H₂ that is not consumed by Marion and Harrison Counties, CFS has agreed to purchase and use the surplus H₂ for use in the H₂ trucks that CFS will operate as part of the DOE funded ARCH2 project. This arrangement will further eliminate GHG emission in two ways:

- The H₂ vehicles operated by CFS will replace diesel vehicles currently in use and will reduce GHG emissions **42 (mtCO₂e/yr)**.
- The diesel fuel that is replaced will not have to be transported from the fuel terminal in Newell, WV to the CFS Depot **0.21 (mtCO₂e/yr)**.

In the event that the demand for H₂ from the county-owned vehicles exceeds the expected H₂ production, Marion County will have the option to add up to an additional 2 MW of solar capacity to increase H₂ production at marginal cost without the need to add additional battery storage capacity or electrolyzer capacity. The additional H₂ used by the counties will result in a higher level of GHG emission reduction.

Measure #3 ensures the full output of the HLH₂ Facility will be used to reduce GHG emissions. As stated above the H₂ production capacity of the HLH₂ Facility is designed to meet the refueling needs of the county-owned vehicles - with only a small amount of surplus H₂. Table 4 below illustrates the GHG emission reduction associated with CFS purchasing and using the estimated surplus H₂ in CFS owned trucks and equipment.

Diesel Use and GHG Emissions From Operation of CFS Trucks						
		(vehicle-mi) per				
HYDROGEN USE BY CFS VEHICLES	Vehicle Info	# of Vehicles	day	(mi/kg H2)	(kg/mo)	Surplus H ₂ (kg/yr)
Long Haul Truck 2	Long Haul Truck	1	86	6.0	286	3,427
Heavy Haul Truck 1	Tri Axle Truck	0	0	0.0	0	0
Heavy Haul Truck 2	Tri Axle Truck	0	0	0.0	0	0
Heavy Haul Truck 3	Tri Axle Truck	0	0	0.0	0	0
0	0	0	0	0.0	0	0
TOTAL		1	86		286	3,427
	(kg/metric ton)=>		1,000		(mt/yr) =>	3.43

Diesel Use Reduction from CFS Trucks	Vehicle Info	# of Vehicles	VMT/day	Diesel (gal/day)	Diesel (gal/mo)	Diesel (gal/yr)
Long Haul Truck 1	Long Haul Truck	1	85.68073593	5	17	4,113
Long Haul Truck 2	Long Haul Truck	0	0	5	0	0
Heavy Haul Truck 1	Tri Axle Truck	0	0	5	0	0
Heavy Haul Truck 2	Tri Axle Truck	0	0	5	0	0
Heavy Haul Truck 3	Tri Axle Truck	0	0	5	0	0
TOTAL		1	86	25	17	4,113

Note: VMT = vehicle miles traveled

GHG Emissions Red. from CFS Trucks	Vehicle Info	# of Vehicles	VMT/day	CO ₂ e (kg/day)	CO ₂ e (kg/mo)	CO ₂ e (kg/yr)
Long Haul Truck 1	Long Haul Truck	1	86	175	3,499	41,990
Long Haul Truck 2	Long Haul Truck	0	0	10	0	0
Heavy Haul Truck 1	Tri Axle Truck	0	0	10	0	0
Heavy Haul Truck 2	Tri Axle Truck	0	0	10	0	0
Heavy Haul Truck 3	Tri Axle Truck	0	0	10	0	0
TOTAL		1	86	216	3,499	41,990

Note: VMT = vehicle miles traveled

CO₂e (mt/day) =>

0.22

CO₂e (mt/yr) =>

42.0

Diesel Use and GHG Emissions from Delivering Diesel to CFS Trucks

Diesel Use Reduction from not Delivering Diesel to CFS Trucks	Fuel Delivered (gal/yr)	Fuel Truck Capacity (gal)	Fuel Deliveries (trips/yr)	Roundtrip Distance (mi/trip)	Diesel Use for Delivery (mi/gal)	Diesel Use for Delivery (gal/yr)
Location of Fuel Sourcing Depot: Ergon Fuel Terminal Newell, WV	4,113	10,000	0	240	5.0	20

GHG Emissions Reduction from not Delivering Diesel to CFS Trucks	Diesel Use for Delivery (gal/yr)	CO ₂ e (kg/gal)	CO ₂ e (kg/yr)	CO ₂ e (mt/yr)
Ergon Fuel Terminal Newell, WV	20	10.21	206	0.21

Table 3. Measure #3: GHG Reduction from Using the Full Output of the HLH₂ Facility

In summary, the HLH₂ Facility will result in cumulative GHG emissions reduction of **9,574 mtCO₂e from 2025 through 2030**. This analysis is based on the assumption that the fleet mix and operating profile of the vehicles being fueled by the HLH₂ Facility remains consistent through the measurement period.

- Measure #1:** Replace diesel HD/MD vehicles with equivalent H₂ fueled vehicles to be used in Marion and Harrison counties (1,638 mtCO₂e/yr).

GHG Emission Reduction from County H ₂ Trucks	
Cummulative GHG Emission Reduction	2025 - 2030
GHG Emission Reduction (mtCO ₂ e)	9,276

- Measure #2:** Eliminate the need to transport diesel fuel from the supply terminal in Newell, WV to refueling depots in Marion and Harrison Counties (7.86 mtCO₂e/yr).

GHG Emission Reduction From Fuel Delivery	
Cummulative GHG Emission Reduction	2025 - 2030
GHG Emission Reduction (mtCO ₂ e)	45

- Measure #3:** Sell any surplus H₂ produced by the HLH₂ Facility and not used for county vehicles to CFS for use in fueling H₂ trucks purchased under ARCH2 and avoid diesel delivery to CFS (63.31 mtCO₂e/yr).

GHG Emission Reduction from CFS Trucks	
Cummulative GHG Emission Reduction	2025 - 2030
GHG Emission Reduction (mtCO ₂ e)	253

- **All Measures (#1, #2, #3):** Total GHG Emission Reduction 2025 - 2030

GHG Emission Reduction from all Measures	
Cummulative GHG Emission Reduction	2025 - 2030
GHG Emission Reduction (mtCO ₂ e)	9,574

b. Magnitude of GHG Reductions from 2030 through 2050

The HLH₂ Facility and the county owned vehicles will enable a cumulative GHG emissions reduction of **33,507 mtCO₂e from 2030 through 2050**. The reduction will be achieved by continuing to use H₂ FCEVs during the 2030 - 2050 analysis period so as to extend the GHG emissions reductions from Measure #1, Measure #2, and Measure #3.

- **Measure #1:** Replace diesel fueled HD/MD vehicles with equivalent H₂ fueled vehicles to be used in Marion and Harrison Counties (**1,546 mtCO₂e/yr**).
- **Measure #2:** Eliminate the need to transport diesel fuel from the supply terminal in Newell, WV to refueling depots in Marion and Harrison Counties (**7.42 mtCO₂e/yr**).
- **Measure #3:** Sell any surplus H₂ produced by the HLH₂ Facility and not used for county vehicles to CFS for use in fueling H₂ trucks purchased by CFS under ARCH2 (**42.2 mtCO₂e/yr**).
- **All Measures (#1, #2, #3):** Total GHG Emission Reduction 2030 - 2050

GHG Emission Reduction from County H ₂ Trucks	
Cummulative GHG Emission Reduction	2030 - 2050
GHG Emission Reduction (mtCO ₂ e)	32,465

GHG Emission Reduction From Fuel Delivery	
Cummulative GHG Emission Reduction	2030 - 2050
GHG Emission Reduction (mtCO ₂ e)	156

GHG Emission Reduction from CFS Trucks	
Cummulative GHG Emission Reduction	2030 - 2050
GHG Emission Reduction from all Measures	
Cummulative GHG Emission Reduction	2030 - 2050
GHG Emission Reduction (mtCO ₂ e)	33,507

During the 2030-2050 analysis period, the US Department of Energy expects significant improvements in the cost and performance of H₂ FCEVs and ICEs. In addition, there will likely be improvements in the performance of diesel engines that will increase the miles/gallon and lower the GHG emissions for diesel fuel. Any such improvements in diesel engine performance would lower the cumulative GHG emissions stated above. However, as the HD/MD trucking industry transitions toward the use of alternative fueled engines, engine manufacturers such as Cummins, Toyota, and Detroit Diesel are shifting their research and development spending from improving diesel engine performance toward the development of alternative fuel engines.

c. Cost Effectiveness of GHG Reductions

The expected GHG emission reductions from the HLH₂ Facility are both quantifiable and measurable. The fleet mix and VMTs can easily be tracked and used to calculate the actual vs. projected GHG emissions reductions. In addition, the HLH₂ Facility is a cost effective means to leverage the investment being made by CFS in H₂ storage and refueling infrastructure. Specifically, HLH₂ Facility does not have to include the cost of a H₂ storage and refueling equipment in its scope, as it can use excess capacity in the CFS Depot. The calculation below provides a measure of the cost effectiveness of achieving the GHG emission reduction from the HLH₂ Facility given the prior analysis:

Cost effectiveness of GHG reductions = (Requested CPRG funding) / (Sum of Quantified GHG reductions from CPRG funding from 2025-2030)

$$\text{Cost Effectiveness} = \$44,153 / 9,574 \text{ mtCO}_2\text{e} = \$4,612 / \text{mtCO}_2\text{e}$$

COST EFFECTIVENESS OF GHG REDUCTION 2025-2030 / 2030-2050		
Cost Effectiveness of GHG Reduction	2025 - 2030	2030 - 2050
CPRG Funds Requested (\$'000)	\$ 44,153	\$ 44,153
GHG Emission Reduction (mtCO ₂ e)	9,574	33,507
Cost of GHG Reduction (\$/mtCO ₂ e)	\$ 4,612	\$ 1,318

This calculation does not ascribe value to the benefits of leveraging the design and operational information from the HLH₂ Facility to inform and optimize similar follow-on projects.

d. Documentation of GHG Reduction Assumptions

The Technical Appendix and the GHG Emissions Spreadsheet attached hereto provide the basis of assumptions for demonstrating the reasonableness of the GHG emission reduction estimates presented. The GHG Emissions Spreadsheet include references to sources of assumptions and the methodology used for developing the estimated GHG emission reductions associated with Measure #1, Measure #2, and Measure #3. A summary of the key vehicle fuel mileage assumptions used in the analysis are provided in the Technical Appendix as well.

The gallons of diesel fuel used by each vehicle during the year was calculated based on a fuel efficiency value provided by the US Federal Highway Administration and an assumed VMT/year. The VMT values were calculated based on an average mile/day provided by Marion and Harrison County transit fleet directors and an assumed 20 operating days/month (with public transit buses operating 30 days/mo).

Section 3: Environmental Results - Outputs, Outcomes, and Performance Measures

a. Expected Outputs and Outcomes

The HLH₂ Facility supports EPA's Fiscal Year (FY) 2022-2026 Strategic Plan in (i) aggressively reducing emissions of GHG that cause climate change, (ii) increasing energy and resource efficiency and the use of renewable energy, and (iii) advancing justice and equity. The HLH₂ Facility will:

- Eliminate the GHG emission for the selected HD/MD vehicles in the truck and bus fleets of Marion and Harrison County, WV;
- Leverage public and private investment in the H2 infrastructure being developed as part of ARCH2;
- Provide a replicable example of how to successfully transition from diesel vehicles to clean fuel vehicles;
- Provide job opportunities and improve the air quality for disadvantaged populations in rural Appalachia.

Outputs:

Marion County has identified the following outputs that will result from the implementation of the HLH₂ Facility that are quantifiable and measurable. The outputs track the performance of the major subcomponents of the HLH₂ Facility, as well as the project as a whole, including:

1. Solar Farm:

- Metered capacity (MW) of installed solar panels.
- Renewable energy (kWh) generated by hour, day, month, and year.

- Capacity factor (% of nameplate) by hour, day, month, and year.
- 2. Battery Energy Storage System (BESS) and Electrolyzer:
 - Quantity of H₂ produced by hour, day, month, and year.
 - Capacity factor (% of nameplate) of BESS and electrolyzer by hour, day, month, and year.
- 3. H₂ Vehicle Fleet:
 - Vehicles in the fleet by number and type per day, month, and year.
 - Vehicles in operation by number and type per day, month, and year.
 - VMT per vehicle per day, month, and year.
 - H₂ usage per vehicle and VMT.
 - Maintenance expense per vehicle per year.
 - Total cost of ownership of each vehicle by year.
- 4. HLH₂ Facility:
 - Total operating cost by day, month, and year.
 - Total capital cost spent by month and year.
 - Revenue from 3rd party sales of H₂ by day, month, and year.
 - Number of jobs created during the construction phase.
 - Number of jobs created during the operational phase.
 - Number of members of low-income and disadvantaged groups employed in operations and maintenance activities.
 - Workforce development and training courses completed by employees by month and year.
 - The establishment of a Community Advisory Board that will consist of local residents, local businesses, and workforce development representatives (e.g., Pierpont Technical College).
 - Community outreach events and activities by month and year.
 - Community complaints or grievances by month and year.
 - Outreach events held with other counties and states to promote the expansion and replication of the HLH₂ Facility

Outcomes:

Marion County intends for the HLH₂ Facility to produce quantifiable outcomes in the areas of emissions reduction, workforce development, and technology/knowledge transfer. Specifically, each of the following outcomes will be tracked and measured to determine the cumulative outcome from calendar years 2025 - 2030 and 2030 - 2050.

1. Emissions Reduction:
 - Reduction in cumulative metric tons of GHG emissions generated from fleet vehicles operated by Marion and Harrison counties:
 - Reduction in cumulative metric tons of GHG emissions generated from the delivery of diesel to the refueling centers in Marion and Harrison counties.
2. Workforce Development:
 - Achieve a defined % of employees hired to be from low-income or disadvantaged groups:
 - Achieve a defined number of training courses to be completed by all employees:
3. Technology Transfer:
 - Assist a defined number of counties/states per year to establish viable value propositions to transition their fleets from diesel fuel to H₂ :

- Conduct a defined number of seminars and open houses per year to showcase and demonstrate the performance of the HLH₂ Facility:

4. Community Engagement:

- Conduct a defined number of community outreach events to highlight the environmental and social benefits of the HLH₂ Facility.
- Establish a “Community Advisory Committee” and conduct a defined number of meetings per year to receive feedback and address concerns and issues regarding the HLH₂ Facility:

b. Performance Measures and Plan

Marion County intends to contract the operation and maintenance of the HLH₂ Facility to a qualified operator (O&M Contractor) and to enter into a service agreement with the CFS Depot to maintain and service the H₂ vehicles. Marion County will contractually obligate the O&M Contractor to manage, operate, and maintain the HLH₂ Facility and to develop and adhere to a “Performance Management Plan” (PMP) consisting of (i) procedures and a system for tracking each of the outputs, and (ii) calculating the progress in achieving each of the outcomes listed above.

The PMP will include the following features:

- Online data is accessible to Marion County, Harrison County, the Community Advisory Committee, and the EPA.
- History of updates and inputs to ensure the PMP is being followed.
- Continual measurement of actual outputs vs. base case outputs.
- Continual measurement of actual outcomes vs. base case outcomes.
- Periodic recalibration and adjustments to reflect changes in macro factors affecting the HLH₂ Facility including asset performance, vehicle mix, VMT, employees, community input, and regulatory guidance.

c. Authorities, Implementation Timeline, and Milestones

A variety of city and county agencies and departments will operate the H₂ vehicles within their fleet. As a condition to use, the agencies and departments will be obliged to cooperate with Marion County in monitoring the the vehicles so as to implement the PMP, such that:

- H₂ fueled school buses will be operated by the school districts of Marion and Harrison County but will be stored at the HLH₂ Facility and maintained by the entity contracted to operate the HLH₂ Facility (the Facility Operator).
- H₂ fueled public transit buses will be operated by Fairmont-Marion Transit Authority and Mountain Line Transit Authority, but they will be stored at the HLH₂ Facility and maintained by the entity contracted to operate the Operator.
- H₂ fueled road construction vehicles, tri axle trucks, and heavy-haul service trucks will be operated by Fairmont City Public Works, Clarksburg City Public Works, the Tri County Water Association, and the White Hall PSD. These vehicles will be stored at the HLH₂ Facility and maintained by the Facility Operator.
- The Facility Operator will have the responsibility for documenting the Outputs and determining progress in achieving the intended Outcomes.

Project Timeline

The schedule below provides a timeline for the construction of (i) the solar farm, battery, and electrolyzer, and (ii) the delivery of the HD/MD vehicles. Marion County expects the project to be completed within 30 months from the grant award.

The tasks outlined for the HLH₂ Facility include finalizing project scope and cost estimates, completing preliminary facility design, obtaining requisite permits, ensuring all contractual agreements are in place, conducting detailed facility design, overseeing construction, initiating facility operations, and conducting performance testing to ensure optimal functionality. Through these concerted efforts, Marion County is poised to spearhead a transformative shift towards a more sustainable and efficient transportation landscape, setting a precedent for regional innovation and environmental stewardship.

The time to construct and commission the solar farm, battery and electrolyzer was based on discussions with several contractors that have successfully constructed these systems. The time to specify, assemble and deliver the HD/MD vehicles was based on conversations with Hyzon and Cummins - two of the leading hydrogen vehicle providers in the US.

Budget Period 1 correlates to Q1 - Q4, Budget Period 2 correlates to Q5 - Q8, and Budget Period 3 correlates to Q9 - Q10.

HLH ₂ Project Schedule											
Task # Solar Farm + Battery + Electrolyzer		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1.0	Design										
2.0	Permitting										
3.0	Contracting										
4.0	Construction										
5.0	Startup and Commissioning										
Task # HD/MD Vehicle		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1.0	Vehicle Specificatoin										
2.0	Vehicle Certification										
3.0	Vehicle Manufacturing										
4.0	Vehicle Driver and Support Training										
5.0	Vehicle Delivery and Commissioning										

Table 3.1 Project Schedule

The project activities are divided into two main tasks. Task one includes the work required at the site to design, permit, procure, and install the solar farm, BESS, electrolyzer, and the required utilities and services. Task two includes the work required to specify, procure, manufacture, and deliver the H₂ vehicles and train the required operators and mechanics. The PMP system's development will track task two. It will be designed during Budget Period 1, developed during Budget Period 2, and implemented during Budget Period 3.

- Budget Period 1:
 - Quantify outputs and develop the processes and procedures to be used in tracking outputs
 - Ensure outputs support outcomes
 - Receive community and EPA feedback on the PMP system and
- Budget Period 2:
 - Develop the necessary software tools to track outputs and calculate outcomes using the PMP system
 - Develop the necessary policies and procedures for vehicle operators to use in entering data and preparing reports using the PMP system.
- Budget Period 3:

- Finalize policies and procedures regarding the use of the PMP system
- Train users and operators on how to use the PMP system and
- Test and implement the PMP System

Section 4: Low-Income and Disadvantaged Communities

a. Community Benefits

The HLH₂ Facility will provide both direct and indirect benefits to the low-income and disadvantaged communities of Marion and Harrison Counties. The production facility and solar farm will improve public health, increase resilience to climate change by implementing the proposed GHG reduction measures, create high-quality jobs, enhance community capacity building, increase access to transportation alternatives, and improve energy security from resilient energy sources. Public health will be improved by the outcomes of the HLH₂ Facility described in Section 3.

The HLH₂ Facility will replace diesel trucks and buses with equivalent H₂ fueled vehicles, and green H₂ fuel will be produced on-site through an electrolysis process powered by solar energy. By reducing GHG emissions from local buses and trucks, the community will see a decrease in CO₂e pollutants that are released directly into the community from vehicle operations. Specifically, the HLH₂ Facility will eliminate 9,574 mtCO₂e during the 2025 - 2030 period. Using on-site solar energy instead of electricity purchased from the grid to generate H₂ further reduces GHG emissions, because the majority of the electricity from the grid is generated using fossil fuels. Producing green H₂ on site also eliminates the trucking requirements to source diesel from the fuel terminal in Newell, WV.

The HLH₂ Facility will create approximately 50 local jobs during the construction period and approximately 8 - 10 technicians will be required once the facility is operational. Marion County and the West Virginia Department of Highways are supporting the project by upgrading the access road connecting the site to State Route 73. The upgrade will widen and straighten the access road increasing safety, improving the driving surface, and controlling storm runoff. Furthermore, the HLH₂ Facility will offer increased access to hydrogen for local businesses and entrepreneurs in the area that would otherwise not be available.

Conversely, the potential disbenefits of this project are few. There will be increased vehicular traffic on the upgraded access road, but this should take place during normal business hours. The upgrade of the access road is intended to mitigate this disbenefit. Please see the attached list of census tracts and census block group IDs designated as disadvantaged by the Climate and Economic Justice Screening Tool and EJScreen indices that this project will affect.

To assess, quantify, and report these benefits and avoid disbenefits, we have developed a Community Action Plan that includes eight approaches:

1. **Project Overview and Education**: We will conduct information sessions to report our estimated and, eventually, actual benefits and disbenefits to the community. During these sessions, we will address community concerns, answer questions, and gather feedback from residents. Some sessions will be in-person, while others will be hosted virtually, increasing accessibility.
2. **Stakeholder Engagement**: We will establish a Community Advisory Board (CAB) comprising representatives from local government, schools, businesses, environmental organizations, and residents. The CAB will hold regular meetings to assess our benefits and avoid disbenefits as we implement the HLH₂ Facility.
3. **Infrastructure Development**: Once the HLH₂ Facility is functioning, we will identify suitable locations for hydrogen refueling stations and charging infrastructure for hydrogen-operated vehicles, particularly focusing on areas with high traffic volumes and public transportation hubs. This will extend the benefits of hydrogen power beyond local bus systems to privately owned

hydrogen-powered vehicles. Progress on this front will be reported to the community during continued information sessions.

4. Deployment of Hydrogen Vehicles: When the HLH₂ Facility becomes operational and the local bus depots and schools begin using hydrogen-powered vehicles, we will be able to monitor and evaluate the vehicles' performance, reliability, and efficiency in real-world conditions. These findings will be quantified and reported to the community during our information sessions.
5. Community Outreach and Engagement: As another approach to reporting any disbenefits that result from our project, we plan to partner with local media outlets to disseminate information to the community and the larger region. We will also seek out opportunities to present our findings at community organization meetings, such as neighborhood associations and civic groups.
6. Safety and Emergency Preparedness: To make the community aware of potential disbenefits, we will train emergency responders and local law enforcement on how to respond to incidents involving hydrogen transportation.
7. Evaluation and Continuous Improvement: We will establish key performance indicators (KPIs) to measure the HLH₂ Facility's environmental, economic, and social impact. Additionally, we will collect data and feedback by surveying stakeholders and community members to assess the project's effectiveness and response.
8. Sustainability and Expansion: As we implement the HLH₂ Facility, we will keep one eye on the future by assessing the feasibility of other uses of hydrogen technology beyond transportation for the local low-income and disadvantaged communities we serve.

Through the above strategies, we will keep track of and communicate the disbenefits of the project to the community. We understand that fostering trust is incredibly important, especially to smaller, more tight-knit communities like the rural counties in West Virginia where the HLH₂ Facility is located. Particularly given the history of Appalachia being exploited by outside groups in the past, we know that showing the local leadership behind this project, and being transparent throughout the development process will be key to our success. Implementing these strategies will help us increase the span of our outreach and create multiple opportunities for community members and stakeholders to learn about our project and express their views. We know that by hearing more voices, we can hear about new ideas and approaches, find solutions to problems, and simply make the community feel a sense of ownership of/participation in this project that we intend to benefit them. We intend to engage the community in dialogue to understand their concerns and establish a working forum to discuss and resolve possible conflicts that may arise.

b. Community Engagement

Marion and Harrison Counties will engage with the community to ensure transparency, mutual trust, and to incorporate community values into project goals while keeping the community informed about significant issues, elements, and changes to the HLH₂ Facility. A Community Advisory Board (CAB) will be created to guide the development of the HLH₂ Facility. The CAB will provide a two-way communication structure to disseminate information about the project to the local community, receive input and feedback from the local community and project stakeholders, and guide the development and implementation of the HLH₂ Facility to align with stakeholder objectives.

The CAB will review project compliance with EPA requirements, and discuss project-level strategies that will provide community benefits, provide timely project-level data and insight to enhance the overall community understanding of the HLH₂ Facility and facilitate project-area stakeholder networks and participation. The CAB will have a governance structure that is representative of the local community to include the Marion Regional Development Corporation, the Harrison County Economic Development

Corporation, Pierpont Technical and Community College, the Marion County Local Emergency Planning Committee, The West Virginia State Building and Construction Trades Council, the Marion County Chamber of Commerce, and the Appalachian Regional Commission.

The HLH₂ Facility coalition will seek input from the CAB on community input topics using various strategies, including feedback generated by the CAB members, regional town halls, participation in community-sponsored events, a public-facing website, an informational dashboard with contact info and reach-out invitations, and accessibility and equity targets across community engagement activity. Community input topics include community and local priorities, project location, community benefits, labor engagement, workforce development, and diversity, equity, inclusion and accessibility (DEIA).

To ensure early and consistent inclusion of various perspectives, mechanisms for engagement will include one-way communication and two-way communication strategies. One-way communication strategies include press releases, news articles, fliers, advertisements, mailer campaigns, websites, social media platforms, signage, billboards, ads, podcasts, and webinars. Two-way communication strategies include town halls, open houses, 1:1 or small group meetings, mediated discussions, trade shows, job fairs, hiring events, meet-the-buyer events, community-sponsored events, and post-secondary education or trade school events. An accessible list of all proposed community engagement opportunities will be made available to the public. The EnergyWise West Virginia Priority Energy Action Plan (PEAP) is made available to the public on the West Virginia Office of Energy's website. Using these varied approaches will enable different groups to respond in ways that they feel most comfortable sharing their thoughts.

A Justice 40 Assessment will be conducted to identify areas where the project can benefit the local community by reducing pollution. The HLH₂ Facility will focus on air pollution reduction by converting existing diesel-fueled trucks and equipment to hydrogen. Through the CAB, the HLH₂ Facility will maintain engagement with special interest groups to understand needs, expectations and overall landscape, implement DEIA principles to meet federal, state and local requirements, and identify community investments to support traditionally excluded stakeholder groups.

In planning this project so far, Marion and Harrison Counties and Hog Lick Aggregates have been in conversation with local schools bus depots, the local emergency services, the Fairmont-Marion County Transit Authority, the City of Fairmont, the White Hall PSD, Tri-County Water. Upon the award of CPRG implementation funding we will reach out to the low-income and disadvantaged communities we plan to serve in Marion and Harrison Counties. By presenting them with the idea for the HLH₂ Facility, we will give them an opportunity to voice concerns, offer suggestions, and express their interest or disinterest in moving forward.

The DOE Office of Clean Energy Demonstrations (OCED) held a virtual listening session on March 27th, 2024, to engage with the local community regarding the development of the Appalachian Regional Clean Hydrogen Hub (ARCH2). The session provided an opportunity for the public to share their thoughts, concerns, and ideas regarding ARCH2 and H₂ in general. Marion County will use the results from this listening session to better understand community concerns and tailor a similar listening session for development of the HLH₂ Facility.

Section 5: Job Quality

The HLH₂ Facility will add high-quality jobs and expand workforce development opportunities in both the construction and the operational phases of the project. The job opportunities will be offered on a preferential basis to local residents in the low-income communities in Marion and Harrison counties.

For the construction phase, Marion County will hire a local engineering firm to design and specify the technical interface between the major project components, secure the necessary permits, arrange for

the subcontracting of the work scope, manage the procurement process, and supervise all onsite construction and installation activities. Engineering firms serving north central West Virginia are not unionized, but they typically pay above market rates to attract qualified staff.

Much of the locally performed construction scope includes preparing the site, installing utilities, constructing roads, erecting the solar panels, and installing the skid-mounted batteries and electrolyzer. Marion County will invite unionized contractors that have the requisite experience and capabilities to competitively bid on this work. As an example, Marion County is currently in discussion with Nitro Construction Services, Inc., a unionized firm from Nitro, WV, that has recent experience installing a solar facility. Holt Renewables, a company affiliated with Nitro Construction Services, provided an indicative quote to install the solar farm and battery storage system which is included in the Technical Appendix.

Marion County will specify in the on-site construction bid documents that selected contractors agree to follow the Department of Commerce and Department of Labor Good Jobs Principles. This includes high road labor practices, paying employees prevailing wages, offering family-sustaining benefits, ensuring equal opportunity, offering opportunities for advancement, prioritizing safety, and remaining neutral in union organizing and operations. In West Virginia, the annual mean wage for all workers is \$49,170 (Bureau of Labor Statistics, 2022). For construction occupations, it is \$52,740 (BLS, 2022).

Once operational, the HLH₂ Facility will employ mechanics, electricians, and engineers to operate and maintain the solar farm, battery energy storage system, and the electrolyzer. In addition, the HLH₂ Facility will enter into a service agreement with CFS to maintain the H₂ vehicles owned by Marion and Harrison counties. Under the agreement CFS will hire and train specialized H₂ mechanics and service technicians to maintain the H₂ vehicles to be owned by CFS and the vehicles owned by Marion/Harrison counties.

Marion County and CFS are currently working with Cummins, Inc and Pierpont Community and Technical College, located in Marion County, to develop the requirements for a H₂ mechanic training program. The training program will be designed to service H₂ vehicle systems that Cummins is developing as well as the H₂ electrolyzer that Cummins has offered through its subsidiary Accelera. Accelera has provided Marion County with a budget electrolyzer quote that is included in the Technical Appendix. The specialized H₂ training that will be offered to mechanics and technicians working on the H₂ vehicles and the drivers that operate these vehicles will open up opportunities for advancement and higher wages.

As outlined in the EnergyWise West Virginia Priority Energy Action Plan (PEAP), the West Virginia Labor Force is well-positioned to support the development of high-quality jobs through workforce education and training. The PEAP identified 145 academic programs in West Virginia, including Pierpont Community and Technical College, that are aligned with the architecture, engineering, construction, and transportation industries.

As discussed in Section 3, Marion County will make it a goal to hire at least 33% of HLH₂ Facility employees from economically and environmentally disadvantaged areas such as—but not limited to—the disadvantaged census tracts the HLH₂ Facility will serve (see Technical Appendix). This goal will not only create new specialized job opportunities in disadvantaged communities, but it will also offer opportunities for these individuals to earn higher wages and receive benefits. Good job quality will ensure the project retains talent, stays on budget, builds community support, and improves the environmental benefits in Marion and Harrison counties.

Section 6: Programmatic Capability and Past Performance

a. Past Performance

Marion County has engaged the West Virginia Region VI Planning and Development Council (Region VI) to administer the CPRG implementation funds as a subrecipient.

Region VI was established by the 1971 West Virginia Regional Planning & Development Act. Its mission is to establish actionable strategies and plans that are responsive to the economic development needs of north-central West Virginia and lay the groundwork for implementable projects and programs.

In West Virginia, Region VI, along with the other regional councils, are structured as locally oriented, public corporations. The councils are directed by elected officials and appointees from a cross-section of the region's social and economic institutions. Region VI has 68 board members, representing the following six counties, Doddridge, Harrison, Marion, Monongalia, Preston, and Taylor, and 39 municipalities.

Region VI's staff of six, has extensive experience administering both federal state grants. Sheena Hunt, Region VI PDC's Executive Director has been with the agency for nearly 20 years. She is an experienced manager with a background of being an executive director for a local economic development office for several years as well as an executive director for a non-profit agency before that. Prior to becoming the executive director at Region VI, she was a project administrator for 11 years at the Region VI PDC. Her duties and experiences have included writing US EDA grants, CDBG grants, along with other grant/funding program applications; administering and overseeing the financial management of said projects; providing guidance for the various programs and projects; overseeing staff; dealing with human resource issues; preparing payroll and associated taxes; and other activities.

In addition to the executive director, there are three project administrators, one of whom has been employed for over five years and is a very skilled administrator and the second one has three years of experience project administration and grant writing. Our third project administrator has been employed for less than a year and is still in training. Region VI PDC also employs a project coordinator, who has been at Region VI for 29 years, and provides support assistance on all grant applications as well to staff members and is proficient in general office management; a project specialist who put in nearly 25 years before retiring and then returning for the last eight years to provide most of the Census data research and mapping as well as being well-versed in labor law/regulations providing labor compliance services; and a part-time accountant with over 30 years of accounting experience who performs the financial duties of the agency. Examples of federal funding administered by Region VI include:

1. North Central Airport Bridgeport, WV: In July of 2022 the U.S. Department of Transportation awarded a grant for \$15mm to construct a new terminal building with a total budget of around \$27 million. Construction began in April 2023 and is expected to be completed in the second half of 2024. The new terminal will be significantly larger than the current one, with more gates, improved baggage claim facilities, and expanded security screening areas. It will feature modern amenities like a passenger lounge, restaurants, and retail stores. The airport is also currently working on developing more land for future commercial and industrial use. This includes the creation of 83 acres of flat developable land as part of the new terminal building project. Marion and Harrison counties have equal ownership of the North Central West Virginia Airport and equal representation on the Bridgeport Airport Authority (BAA).
 - Federal Funding Agency: US Economic Development Administration
 - Project Name: North Central WV Airport (Benedum Airport Authority) Benedum Logistics Park
 - Federal Award Number: 01-79-14830
 - Non-Federal Funding Agency: Benedum Airport Authority
 - Project Reporting Requirements
 - SF-425 Semi-Annual Federal Financial Reports
 - EDA Quarterly Progress Reports
 - SF-271 Outlay Report and Requests for Reimbursements for Construction Programs (included EDA Expenditures spreadsheet)
 - Davis-Bacon Wages (certified payrolls)

- Project Closeout Required Documents
- Funding Agency Contact: Richard Horenburger

2. Doddridge County Public Service District Blandville Water Line Extension Project

- Federal Funding Agency: US Economic Development Administration
- Federal Award Number: 01-79-14861
- Non-Federal Funding Agency: Doddridge County Public Service District
- Project Reporting Requirements
 - SF-425 Semi-Annual Federal Financial Reports
 - EDA Quarterly Progress Reports
 - SF-271 Outlay Report and Requests for Reimbursements for Construction Programs (included EDA Expenditures spreadsheet)
 - Davis-Bacon Wages (certified payrolls)
 - Project Closeout Required Documents
 - Funding Agency Contact: Kai Waetcher

3. Mid-Atlantic Aerospace Complex (MAAC) Storm Sewer Infrastructure Project

- Federal Funding Agency: US Environmental Protection Agency
- Federal Award Number: XP-973586-01
- Non-Federal Funding Agency: Benedum Airport Authority
- Project Reporting Requirements
 - SF-425 Semi-Annual Federal Financial Reports
 - EDA Quarterly Progress Reports
 - SF-271 Outlay Report and Requests for Reimbursements for Construction Programs (included EDA Expenditures spreadsheet)
 - Davis-Bacon Wages (certified payrolls)
 - Project Closeout Required Documents
 - Funding Agency Contact: Grant ran through WV Bureau of Public Health Infrastructure Division, Christopher Thomas

4. Morgantown Utility Board (MUB) Water Line Extension

- Federal Funding Agency: US Economic Development Administration
- Federal Award Number: 01-79-15121
- Non-Federal Funding Agency: Morgantown Utility Board
- Project Reporting Requirements
 - SF-425 Semi-Annual Federal Financial Reports
 - EDA Quarterly Progress Reports
 - SF-271 Outlay Report and Requests for Reimbursements for Construction Programs (included EDA Expenditures spreadsheet)
 - Davis-Bacon Wages (certified payrolls)
 - Project Closeout Required Documents
 - Funding Agency Contact: Rupsha Ghosh

5. Flemington Sewer System Improvements & Extension Project

- Federal Funding Agency: US Environmental Protection Agency and US Housing & Urban Development
- Federal Award Number: EPA XP-963071-01; HUD/WV 11SCBG0034

- Non-Federal Funding Agency: WV Department of Environmental Protection CWSRF Loan & Debt-Forgiveness Loan
- Project Reporting Requirements
 - EPA
 - SF-425 Semi-Annual Federal Financial Reports
 - EPA SF-271 Outlay Report and Requests for Reimbursements for Construction Programs (included EDA Expenditures spreadsheet)
 - Davis-Bacon Wages (certified payrolls)
 - EPA Project Closeout Required Documents
 - Funding Agency Contact: Bruce Smith
 - HUD/WV CDBG
 - Monthly Progress Reports
 - Requests for Payment
 - Davis-Bacon Wages (certified payrolls)
 - Sem-Annual Labor Reports
 - Final Performance Report
 - Funding Agency Contact: WV Dept. of Economic Development (DED), Tony O’Leary

Marion County is in the north central region of West Virginia with a population of approximately 56,000. The County Commission is the governing body of Marion County and is made up of three officials, elected to a 6-year rotating term. Each Commission must reside in a different magisterial district (Palatine, Middletown, or West Augusta).

The Marion Regional Development Corporation (MRDC) is a non-profit, private economic development organization, sponsored by the Marion County Commission and the City of Fairmont. MRDC promotes new investment, job creation, and the retention of existing businesses across Marion County, West Virginia. MRDC developed the I-79 Technology Park, Fairmont Industrial Park, Valley Industrial Park, and the Marion Regional Business Park creating millions of dollars in new investment and thousands of jobs.

Grants received by Marion County are either administered internally by the following individuals, or the grant administration is contracted to West Virginia Region VI Planning and Development Council (see above).

- Kriss Cinella, Marion County Administrator
 - Belinda Biafore, Marion County Economic & Community Development Grant Coordinator
 - Bruce McDaniel, Executive Director Marion Regional Development Corporation
 - Shae Strait – City of Fairmont Director of Planning and Development
1. American Rescue Plan: US Congress: Marion County received \$10.87mm of grant funding.
 - Federal Funding Agency: US Treasury
 - Assistance Agreement Number: CFDA#21.027
 - Compliance Requirements: 2 CFR Part 200
 2. FY 2022 Homeland Security Grant
 - Federal Funding Agency: US Department of Homeland Security
 - Assistance Agreement Number: EMW2022-SS-00027
 - Compliance Requirements: 2 CFR Part 200
 3. FY 2019 Emergency Management Performance Grant

- Federal Funding Agency: FEMA
- Assistance Agreement Number: EMP-2019-EMP-001
- Compliance Requirements: 2CFR Part 200

Harrison County is in the north central region of West Virginia bordering Marion County to the south with a population of approximately 65,000. The County Commission is the governing body of Harrison County, and functions as the County Executive. The County Commission consists of three Commissioners, each elected to 6-year terms.

The Harrison County Economic Development Corporation (HCEDC) promotes, develops, and advances the business prosperity and economic welfare of Harrison County for the benefit of all citizens without favoritism or bias to any government, region, entity, or person. Harrison County has zero percent tax-increment financing (TIF) available, a stable workforce, extensive fiber optic networks and access to North Central West Virginia's longest commercial runway at the North Central Airport. At present, there are seven business parks available ranging in size from the MCP Mountaineer Energy Park in Clarksburg to Charles Point in Bridgeport. Other available sites include White Oaks, Meadowbrook Industrial Park LLC, the Mid Atlantic Aerospace Complex North Central West Virginia Airport, and the Meadowbrook Business Park. Economic development activities at HCEDC are managed by a staff of two:

- Amy Haberbosch Wilson, Executive Director Harrison County Economic Development Corporation
- Luis Ramirez, Harrison County Economic Development Assistant

Clean Fuel Services LLC (CFS) is developing the CFS Depot, a hydrogen storage and refueling depot that will be located adjacent to the CFS H₂ Facility. The CFS Depot is part of the US DOE funded Appalachian Regional Clean Hydrogen Hub (ARCH₂) and the depot will store and supply hydrogen fuel to heavy-/ medium-duty trucks and equipment that will be owned by the CFS Depot and by third parties.

Marion County will enter into a performance-based service agreement with CFS to maintain and service the H₂ vehicles owned by Marion and Harrison counties. CFS will hire, train, and manage the resources required to operate and maintain the hydrogen vehicles to achieve the stated GHG emissions reduction. CFS may competitively bid to supply operation and maintenance services for the HLH₂ Facility as well under a market-competitive agreement (O&M Agreement).

Brian Redmond, President of Clean Fuel Services LLC, has extensive experience developing, owning, and operating renewable energy projects, natural gas projects, and heavy-duty construction equipment. Mr. Redmond has over 30 years of experience in energy, chemicals, and natural resources. He has held senior management positions in both renewable and fossil fuel energy production, industrial chemicals, and commercial aggregate quarrying.

Mr. Redmond is a co-founder and managing director of both Paragon Energy Holdings LLC ("PEH") an energy advisory firm, and Paragon Asset Group LLC ("PAG") an investment firm that has owned and operated over \$350MM of renewable and traditional energy assets, natural resource projects, and non-traditional equity investments. During his career, Mr. Redmond has held operating positions as President of Hog Lick Aggregates LLC, President of ALTIVIA Petrochemicals, President of Houston Pipeline Company, President of Louisiana Resource Company. In these roles Mr. Redmond had direct P/L responsibility for a \$2 billion energy asset portfolio and six years of responsibility managing asset development in Indochina, the Middle East and Turkey. Mr. Redmond earned his Master of Business Administration from Harvard Business School, a Masters in Mechanical Engineering from Georgia Institute of Technology, and a Bachelor of Science in Mechanical Engineering from Virginia Tech.

Section 7: Budget

Project Budget

The summary Project Budget below is further described in detail in the attached Budget Narrative and Detailed Budget Spreadsheet. Budget values were developed based on market research and indicative bids provided by equipment suppliers, construction contractors, and facility operators. Standard industry metrics were used to validate vendor cost estimates.

Project Budget		
Budget (Installed Cost)	CapEx (\$'000)	Note
Industrial Access Road	\$ 1,800	Vendor Quote
Site Preparation	\$ 750	Contractor Estimate
Solar Farm	\$ 13,475	Vendor Quote
Battery	\$ 7,889	Vendor Quote
Electrolyzer	\$ 3,500	Vendor Quote
HD/MD Vehicles	\$ 11,600	See table below
Water Supply + Treatment	\$ 200	Vendor Estimate
Power Interconnect + Substation	\$ 700	Vendor Estimate
Separator + Dryer + Compressor	\$ 400	Budget quote by vendor
Total CapEx (\$'000)	\$ 40,314	
Land Purchase	\$ 1,995	Fair market value
Engineering, Permits, Mgmt	\$ 2,250	Contractor estimate
Hydrogen Systems Consultant	\$ 300	Contractor estimate
Community Outreach	\$ 100	Contractor estimate
Project Administration	\$ 843	Contractor estimate
Grant Administration	\$ 150	Contractor estimate
Total Land + Soft Cost (\$'000)	\$ 5,638	
Total Project Cost (\$'000)	\$ 45,953	
CPRG Funding Requested	\$ 44,153	
Marion Cty/WV DOH Funds	\$ 1,800	
	\$ 45,953	