



**I. Project Description: The Gulf Louisiana Offshore Wind (GLOW) EDA Tech Hub, led by the National Center for Advanced Manufacturing (NCAM), will be a global destination for prototyping, demonstrating, and manufacturing the next generation of offshore energy technologies – with an immediate focus on offshore wind (OSW).** Leveraging Louisiana’s leadership in offshore energy production, specialized infrastructure, and robust energy R&D ecosystem, GLOW will accelerate the commercialization of technology and supply chain solutions for wind energy (KTFA #9: advanced energy and industrial efficiency technologies). GLOW will operate a first of its kind multi-purpose offshore demonstration area provided by the State of Louisiana Mineral Energy Board, an onshore R&D turbine operated by Gulf Wind Technology and will employ local research faculty to manage a 3-year metocean campaign that develops invaluable climactic, hydrodynamic, and environmental data. Data provided by the Offshore Propeller will feed into NCAM and Sev1tech’s digital twin of the offshore demonstration area and planned wind energy areas in the Gulf of Mexico – enabling GLOW innovators to study performance issues, generate possible improvements, and de-risk future physical pilots. This virtual product development environment will accelerate development of offshore energy solutions from key industry partners like Vestas and Siemens Gamesa Renewable Energy. GLOW will also develop a local, competitive workforce that is prepared to service the next generation of offshore energy production and manufacturing. Together, GLOW is uniquely positioned to support advanced technologies, domestic manufacturing, and OSW supply chain efficacy with a focus on workforce development – empowering U.S. competitiveness in the global energy transition.

**II. Synopsis:**

Table 1. A. Consortium & Partners (Core consortium members; Supporting partners; *Partners external to the GLOW region)
<b>INSTITUTIONS OF HIGHER EDUCATION.</b> Louisiana State University (lead); University of New Orleans; Tulane University; Xavier University of Louisiana; Southeastern Louisiana University; Southern University A&M; Nicholls State University
<b>INDUSTRY &amp; RESEARCH CONSORTIA.</b> National Center for Advanced Manufacturing (NCAM); GNOwind Alliance; Future Use of Energy in Louisiana (FUEL); H2theFuture; UNO Research & Technology Foundation & LA Wind Energy Hub; National Offshore Wind R&D Consortium*; Southeast Wind Coalition (SEWC); Newlab*
<b>INDUSTRY FIRMS.</b> RWE; Gulf Wind Technology; Opportunity Hub Foundation; Sev1Tech; Edison Chouest; Vestas; Siemens Gamesa Renewable Energy; Worley/Advisian; G.I.S.; Exxon Mobil; T. Baker Smith; Morrison Energy; Balanced Media Partners;
<b>CITY, STATE &amp; REGIONAL GOVERNMENT.</b> City of New Orleans; Louisiana Economic Development; Louisiana Workforce Commission; Louisiana Department of Energy & Natural Resources; Louisiana Department of Wildlife and Fisheries
<b>ECONOMIC DEVELOPMENT ORGANIZATIONS.</b> SoLA Super Region; Greater New Orleans Development Foundation; City of New Orleans Office of Economic Development (GNODF); Greater Lafourche Port Commission;
<b>WORKFORCE.</b> Nunez Community College; Delgado Community College; Fletcher Community College; 1881 Institute; Louisiana Community & Technical College System; City of New Orleans Office of Workforce Development, Louisiana Workforce Commission

The GLOW Consortium will unlock the United States’ offshore wind potential through innovation. With generational experience servicing 97% of all U.S. OCS oil and gas production<sup>1</sup>, Louisiana is leading the charge in domestic offshore wind (OSW) – Oceantic Network reports 20+% of OSW contracts are with Gulf firms<sup>2</sup> supporting 1<sup>st</sup>-tier wind areas on the East Coast. However,

1 <https://www.boem.gov/regions/gulf-mexico-ocs-region/oil-and-gas-gulf-mexico#:~:text=The%20Gulf%20continues%20to%20be,OCS%20oil%20and%20gas%20production>.

2 <https://oceantic.org/supplychain/>

achieving the national goals of 30 gigawatts (GW) of OSW by 2030<sup>3</sup>, and beyond to 110 GW by 2050, will depend on successful activation of 2nd-tier markets such as the Gulf of Mexico (GOM). Per the National Renewable Energy Laboratory (NREL), the GOM carries most of the nation's total technical potential capacity<sup>4</sup>. This means that if its wind resources were captured, the region could provide an excess of emission-free energy to the nation's industry and homes. Technologies designed to enable nascent 2<sup>nd</sup>-tier wind markets include wind turbines optimized for lower wind resources and hurricane force winds. These solutions can also support international markets yet to pursue OSW and improve the performance of existing developments – presenting opportunities to extend U.S. energy leadership globally with immense economic development potential regionally.

**B. GLOW Components:** Through its four components, GLOW will offer industry and entrepreneurs a single point of entry to one of the nation's most critical energy ports, direct access to state-designated waters for offshore wind research and technology demonstration, transformational digital twinning and modeling capabilities, offices and industry-scale equipment, as well as connectivity to universities and community colleges supporting the next generation of offshore energy professionals: **(1) The GLOW Offshore Propeller Testbed, led by the National Center for Advanced Manufacturing (NCAM), will be a first of its kind destination for developing the next generation of offshore energy technologies – with an immediate focus on offshore wind (OSW).** Based at Port Fourchon, and operated by NCAM, the testbed is uniquely positioned to utilize existing infrastructure and an adjacent offshore demonstration area provided by the State of Louisiana following GLOW's Tech Hub designation. The testbed will lead a robust metocean campaign and leverage an onsite R&D wind turbine operated by Gulf Wind Technology, to provide a unique product development environment for offshore energy innovators. Further, the metocean campaign will de-risk OSW development in the Gulf of Mexico by producing invaluable data for both developers like RWE and Vestas Steelhead, as well as state agencies including the Louisiana Department of Wildlife and Fisheries. Building upon a partnership with NCAM's New Orleans facility, NASA, and Louisiana State University, the Offshore Propeller will offer cutting-edge digital prototyping solutions – currently supporting components of the Artemis II rocket – to emerging offshore energy technologies. By filling significant facilities gaps in the national R&D ecosystem and supporting the feasibility of new offshore energy applications, The Offshore Propeller stands to empower national and global strategies for decarbonization. **(2) GLOW Innovation, led by Louisiana State University and Greater New Orleans Development Foundation (GNODF), will accelerate the development of offshore energy technologies by offering comprehensive commercialization programs and pilot project support in the heart of the nation's offshore energy capitol.** With support from the National Offshore Wind Consortium (NOWRDC), GLOW will establish a tailored solicitation process that prioritizes innovations that reduce the cost of OSW in the U.S and enable markets across the globe. Through its governance structure, GLOW Innovation will be led by a diverse array of research institutions that are actively supporting technologies for a new era of offshore energy production. In collaboration with the Future Use of Energy in Louisiana (FUEL) NSF Engine, H2theFuture, and a national accelerator partner, GNODF will establish the GLOW Industry Hub for offshore energy entrepreneurship – including commercialization services and fellowships, startup support, and an Innovation Fund that offsets the costs to prototype and pilot novel technologies. The Opportunity Hub Foundation will extend

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3 <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/>

4 Lopez, Anthony, et al. "Offshore Wind Energy Technical Potential for the Contiguous United States [Slides]." Offshore Wind Energy Technical Potential for the Contiguous United States [Slides] (Technical Report) | OSTI.GOV, NREL, 15 Aug. 2022, doi.org/10.2172/1882929.

its New Energy Technology Incubator for BIPOC founders to service cohorts of diverse energy innovators. **(3) GLOW Getting Ready for Offshore Wind (GROW)** will cultivate the next generation of offshore renewable energy professionals – filling significant workforce gaps in the United States. According to the National Renewable Energy Laboratory (NREL), the domestic OSW industry will require more than 44,000 workers by 2030<sup>5</sup>. Driven by insights from the GNOwind Alliance and GLOW Workforce Development Board, GLOW’s academic and training partners will deepen the alignment between existing energy curriculum and wind industry needs through novel work-based learning opportunities. This approach will cultivate deeper relevance to the wind industry while simultaneously targeting students across several target participant groups including: 1) incumbent workers; 2) rural workers; 3) BIPOC communities; and 4) Future workers. GLOW will partner with the 1881 Institute to support programs dedicated to helping underrepresented populations start careers in engineering and technology. To further address barriers to accessible training and employment opportunities, GLOW GROW partners will operate a wraparound services fund that supports transportation, childcare, and other constraints that may limit impact to target populations. **(4) GLOW Governance** will be managed by the consortium’s lead organization Louisiana State University (LSU) and participated in by all members of the Tech Hub. LSU is a national energy leader, serving as a key R&D partner in GNO Inc.’s EDA-supported H<sub>2</sub>theFuture and leader of the National Science Foundation (NSF)’s largest Regional Innovation Engine award, FUEL. The university’s designations and state reach position it to be an effective organization to lead the GLOW effort and its governing bodies. Governance plays the crucial role of ensuring the effective implementation of GLOW Innovation’s commercialization and startup support activities, GROW’s workforce activities and wraparound services, as well as sustainable management of the Tech Hub’s key assets at the Offshore Propeller Testbed. By establishing clear guidelines, structures, and processes for oversight and evaluation, decision-making, and collaboration, GLOW Governance facilitates the alignment of research objectives with industry needs and ensures the post-award sustainability of the Tech Hub.

**C. Investment, Policy, and Relevant Commitments to GLOW:** The GLOW consortium recognizes the importance of a wider ecosystem of support and is progressing in the context of the State embracing decarbonization as a statewide economic opportunity, and OSW as a compelling workforce, innovation and economic driver. The Louisiana Climate Action Plan established a goal of 5GW by 2035. GLOW’s Offshore Propeller Testbed is made possible by 2022 legislation that enabled the offshore research area lease<sup>6</sup>, a first of its kind nationally, and the Tech Hub will support the Comprehensive Offshore Wind Roadmap for Louisiana tasked to the Louisiana Department of Energy & Natural Resources in 2023<sup>7</sup>. Since its Tech Hub designation, GLOW has secured key commitments to the Tech Hub including: an offshore research and demonstration area provisioned by the State Mineral Energy Board; facilities from Port Fourchon and the National Center for Advanced Manufacturing (NCAM); an onshore R&D turbine operated by Gulf Wind Technology; unencumbered, available, cash match from Louisiana Economic Development (\$5M), as well as contributions from research institution and industry partners (See Appendix: ‘Commitment Index’).

**D. Opportunities for Global Competitiveness and National Security:** As the world seeks to

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5 Stefek, Jeremy, Chloe Constant, Caitlyn Clark, Heidi Tinnesand, Corrie Christol, Ruth Baranowski. 2022. *U.S. Offshore Wind Workforce Assessment*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5000-81798. <https://www.nrel.gov/docs/fy23osti/81798.pdf>

6 La. Act 443

7 LA DENR RFI 3000022109

triple renewables by 2030<sup>8</sup> in response to climate change, experts are increasingly attentive to the impacts this transition will have on geopolitical relationships drawn around lines of energy trade such as with petroleum and LNG. A strategic shift in global energy leadership through renewables like offshore wind is thus a critical geopolitical strategy for the for the United States<sup>9</sup>. Competing economies like China are on track to accomplish 2030 decarbonization targets 6 years ahead of schedule representing 60% of global renewable energy capacity online by 2028<sup>10</sup>. Beyond supporting its own national energy security, China is also a global manufacturing leader of offshore wind technologies and is leveraging these capacities to extend its energy influence globally. The Chinese Wind Export Association (CWEA) reports that 112 turbines units were exported to 49 countries across 5 continents<sup>11</sup>. As a Tech Hub, GLOW seeks to replicate the technological impacts of the “Shale Revolution” for liquified natural gas (LNG) by facilitating the U.S.’s rise as an offshore wind leader. By investing in the right technologies at the right time, the U.S. quickly rose as a global energy leader – exporting more LNG than any other country with Louisiana exports accounting for 50% of these. This has supported energy security to key allies and trade partners in the face of conflict<sup>12</sup>, while creating 169,000 domestic jobs in just two years<sup>13</sup>. **In making similar, timely investments in market-enabling wind energy technologies through the GLOW Tech Hub, EDA can support the U.S. in achieving global competitiveness in a sector where the country is presently behind.** With over 380GW of offshore wind capacity across thirty-two markets predicted to be developed in the next ten years<sup>14</sup>, the opportunity to develop new lines of trade between the U.S. and emerging offshore wind markets is substantial.

**E. GLOW is deeply committed to advancing climate and environmental responsibility and will maintain these priorities as the consortium works to develop solutions for responsible OSW development.** By supporting the country’s 2030 OSW targets, GLOW can support offshore wind’s capacity to remove up to 78M metric tons of CO<sub>2</sub> emissions per the DOE. A key strategy for GLOW is the Tech Hub’s emphasis on research aimed at better understanding and mitigating the environmental impacts of offshore energy development. GLOW will support the Louisiana Department of Energy and Natural Resources (DENR) and the Office of Coastal Management (OCM) by strategically deploying the metocean campaign that include sensors and technologies tracking species of concern such as small birds and bats. By supporting state and federal planning efforts, GLOW is ensuring that the development of commercial offshore wind farms is done in harmony with the marine and coastal ecosystems that make Louisiana as biologically rich as it is energy endowed. For GLOW’s facilities and future offshore demonstration activities, GLOW will conduct careful site selection, design modifications, and the implementation of best practices that prioritize ecological preservation. Implementation planning for the Offshore Propeller Testbed is currently being supported by Worley (see appendix) – an industry-leading engineering firm utilizing its technical resources across Louisiana and experience supporting over 2,360 energy transition projects including over 860 wind projects.

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8 COP 28

9 Center on Global Energy Policy at Columbia University

10 <https://www.iea.org/reports/renewables-2023/executive-summary>

11 CWEA 2022 Data

12 The United States Exported More LNG than Any Other Country in the First Half of 2023 - U.S. Energy Information Administration (EIA), 12 Sept. 2023, [www.eia.gov/todayinenergy/detail.php?id=60361](http://www.eia.gov/todayinenergy/detail.php?id=60361).

13 Stephen Brown & Mine Yucel, “The Shale Gas and Tight Oil Boom: U.S. States’ Economic Gains and Vulnerabilities,” *Council on Foreign Relations* (October 2013).

14 The 2023 Global Offshore Wind Report

**F. Ensuring equitable impacts and accessibility to GLOW programming is embedded across all components of the GLOW Tech Hub and is evaluated by its Governance structure.**

Louisiana has an unprecedented opportunity to shift historical inequities in energy employment towards a future characterized by intentional inclusion and strength in diversity. Recognizing the need to promote inclusion from its genesis, GLOW’s Governance structure includes a Diversity, Equity, Inclusion, and Accessibility Board (DEIAB) comprised of diversity and inclusion leaders, Louisiana’s Workforce Commission, and consortium members from other GLOW boards. The DEIAB will ensure equity and accessibility concerns are comprehensively and effectively considered across all GLOW activities. The board will also support sustainability measures to acquire new funding and support, including leveraging Louisiana’s status as an NSF EPSCoR state to secure research funding that complements GLOW’s mission. In addition to this overarching equity structure, both the Innovation and Workforce program components include equity partners Opportunity Hub (OHUB) and 1881 Institute (respectively) to ensure BIPOC founders and workforce are intentionally cultivated and integrated into the Tech Hub.

**G. Several outcomes will characterize GLOW’s success as a Tech Hub empowering regional and national economic development by catalyzing domestic offshore energy innovation:**

**Jobs from Enabling Gulf of Mexico OSW:** Over the performance period, GLOW expects to support the feasibility of 9 offshore wind developments in the Gulf of Mexico<sup>15</sup> and Louisiana State Waters<sup>16</sup>, leveraging Louisiana suppliers and technologies commercialized through GLOW. The 9 GOM developments are projected to yield 1,400 permanent jobs and 40,000 construction jobs with over \$4B in CAPEX by 2030<sup>17</sup>.

**Generation of Intellectual Property (IP) & Small Business Creation:** GLOW Innovation will support over 60 offshore energy startups – including pilot projects with support from the GLOW Offshore Propeller Testbed. Creation of valuable intellectual property leading to new startups, partnerships with established energy companies, and domestic manufacture of these technologies to support domestic and global wind farms. This activity can result in over 800 jobs in the region and additional private investment towards company growth.

**Large-Scale Component Manufacturing and Supporting National Supply Chain:** Two of GLOW’s foundational industry partners, Vestas (developing a Louisiana OSW farm in Cameron Parish through Steelhead) and Siemens Gamesa Renewable Energy, are the largest original equipment manufacturers for offshore wind. Both are committed to leveraging GLOW to explore a larger manufacturing presence in South Louisiana, with a potential to establish up to 1,000 jobs per facility. Louisiana-based suppliers already represent 20% of the contracts in

GLOW Total 2030 Impacts	
<b>Total Job Creation</b> (OSW Developments; Small Business Creation; Domestic Supply Chain Growth)	<b>258,720</b>
Construction Jobs	40,000
Direct Job Creation	19,260
Indirect Job Creation	137,308
Induced Job Creation	62,153
<b>Labor Income</b>	<b>16,410,361,421.25</b>
<b>Regional Employment Growth</b>	<b>11.55%</b>
Value Added (GDP Contribution)	26,623,276,499.11
<b>Regional GDP Growth</b>	<b>9.58%</b>
Capex	42,900,000,000.00
Equity Impact – Job Creation for Workers	
<b>People of Color</b>	<b>6,741</b>
<b>Rural</b>	<b>963</b>
<b>Displaced Energy Workers</b>	<b>4,815</b>
DOE Offshore Wind (OSW) Targets	
<b>2030 Cost Reduction Target Supported</b>	<b>\$51/megawatt-hour (MWh)</b>
<b>2030 CO2 Reduction Target Supported</b>	<b>78,000,000M Metric Tons</b>

15 BOEM Gulf of Mexico Activities  
 16 Office of Mineral Resources: Wind Energy Operating Agreements  
 17 Musial W, Beiter P, Stefek J, Scott G, Heimiller D, Stehly T, Tegen S, Roberts O, Greco T, Keyser D (National Renewable Energy Laboratory and the

Alliance for Sustainable Energy, LLC, Golden, CO). 2020. Offshore wind in the US Gulf of Mexico: regional economic modeling and site-specific analyses. New Orleans (LA): Bureau of Ocean Energy Management. 94 p. Contract No.: M17PG00012. Report No.: OCS Study BOEM 2020-018.

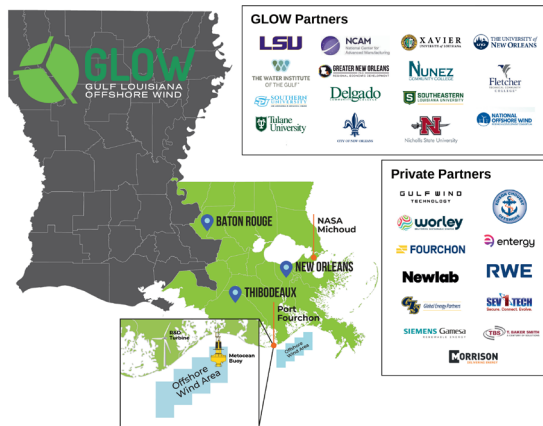
offshore wind nationally, which could further increase job growth by as much as 15,460 positions (NREL Workforce Assessment). **Workforce Development Projections from GLOW GROW:** GLOW is supporting training and higher education programs across 3 community technical colleges, 7 higher education institutions including 2 HBCUs, 1 apprenticeship partner, and over 20 industry partners. These initiatives stand to impact 1,225 students/trainees, with current industry commitments representing 1,027 having clear job opportunities post-graduation/completion.

**H. Timeline for Implementation:**

Project	Y1	Y3	Y5
<b>GLOW Governance</b>	First meetings and hires executed; Implementation of Governance bylaws and policies; Evaluation system established by LSU	Mid-project review is conducted to evaluate impacts of Tech Hub; DEIAB assess equitable impacts to date;	Successful transition to sustainability mechanisms that extend the Tech Hub’s impact through the decade
<b>GLOW Offshore Propeller Testbed</b>	Engineering and permitting; further identification of potential demonstration activities; Metocean study and virtual product environment development	Mid-project review of metocean campaign; virtual product development environment is available; first physical pilots are underway in offshore demonstration area	Virtual product environment offers digital twin of planned wind energy areas and has supported product development for at least 40 companies; physical pilots continue
<b>GLOW Innovation</b>	Technology targets identified with NOWRDC; Industry Hub established; First solicitation for company proposals deployed	Third solicitation deployed; Industry Hub supporting 50% GOM technologies and 50% national innovation targets	First GLOW technologies commercialized; Companies establish local and domestic manufacturing presence to service global market
<b>GLOW GROW</b>	Curriculum development begins; Wraparound services are scoped;	Trainings are online; First work based learning programs are underway; 50% of wraparound services have been deployed	Graduates are employed into good quality jobs through GLOW Industry partners

**III. Technology Challenges Addressed & Nexus of Impact:** Offshore wind has been hit hardest by the new macroeconomic environment characterized by a strained supply chain and high costs, affecting the existing project pipeline in the U.S. This is creating strong demand for new and innovative technologies, as well as optimized solutions for the existing supply chain. As is the case in the U.S., many emerging markets for offshore wind globally begin with 1<sup>st</sup>-tier areas where wind resources are strongest and existing technologies can support development. To achieve the full potential of available wind energy, many of these global markets will need to capitalize on lower wind resource areas as well as shallower and deepwater resources – demonstrating an alignment between the global market and GLOW’s initial technology priorities. At a regional level, NREL concluded that hurricane risk was one of the major challenges that would need to overcome for a mature offshore wind industry to develop in the Gulf of Mexico. With a primary focus on advanced energy and industrial efficiency technologies supporting offshore wind energy (KTFA #9), **GLOW transforms Louisiana’s working coast – a global port and the critical infrastructure for energy production – into a new kind of talent and technology development platform.** Through its partnership with NOWRDC, GLOW will offer OSW innovators across the country access to its programs – ensuring the initiative is supporting the needs of the greater domestic supply chain and project pipeline here in South Louisiana. GLOW Innovation will also support over 60 startups operating at a nexus of other renewables aligned with the CHIPS and Science Act, including (but not limited to) offshore electrolysis, alternative materials for offshore wind components, advanced manufacturing solutions, and AI products optimizing wind farm development and operations. **The GLOW Tech Hub will primarily operate across the Southeast Louisiana**

**(SoLA) Super Region with a vision for state-wide impacts on industry competitiveness and decarbonization results.** Many companies worldwide have located their largest global facilities and most critical infrastructure within this region – 65% of Louisiana’s population and over 68% of all jobs in Louisiana are in the Super Region. Louisiana leads the nation’s energy landscape by any measure of production. But in measures that matter to societal impacts – such as education and innovation – the State suffers from a legacy of disinvestment and poverty. Since the first submersible drilling rig pioneered offshore oil and gas, South Louisiana has been a beacon of energy innovation and established the U.S. as a global energy leader – driven by innovative and visionary ambitions. Louisiana’s prowess is greatly attributed to technological innovations and world-class facilities that have unlocked complex industries including the aerospace sector<sup>18</sup>. Louisiana’s outsized contribution to the energy, chemical, and petrochemical industries is evident in its environmental output: the state ranks first in energy consumption on a per capita basis<sup>19</sup> and sixth nationally in carbon dioxide (CO<sub>2</sub>) emitted. With its significant disparate economic impacts and population challenges, no state in the nation is better motivated and positioned to impact the energy



landscape than Louisiana. As evidenced by the GLOW coalition of partners, Louisiana is ready to reinvent itself as the epicenter of national energy innovation and create a powerful offshore wind energy Tech Hub.

**VI. Public and Private Sector Engagement:** The GLOW Tech Hub has been developed in partnership with the State of Louisiana, the City of New Orleans, regional economic development organizations, public research institutions, and non-profits. GLOW also builds on South Louisiana’s private sector leadership in offshore energy production: **RWE, and GNO, Inc.’s GNOWind Alliance developed the Louisiana Offshore Wind Supply Chain tool** to accelerate the engagement of Louisiana’s offshore wind supply chain – revealing more than 123 Louisiana businesses that are operationally ready to support the national offshore wind supply chain. 95% are small businesses and 42% have future investment plans to prepare for the offshore wind industry<sup>20</sup>. Oceantic Network additionally reports 20+% of OSW contracts are with Gulf firms<sup>21</sup> supporting 1<sup>st</sup>-tier wind areas on the East Coast. The GLOW consortium includes industry leaders and local innovators who are committed to supporting the Tech Hubs activities: RWE is the only developer in the U.S. with a lease on three coastlines; Vestas and Siemens Gamesa represent two of the largest original equipment manufacturers of offshore wind components globally; Edison Chouest a Louisiana-based company constructing the first-ever US-flagged OSW service operations vessel; Gulf Wind Technology established a research, training, and technology demonstration program in partnership with Shell. Locally, companies like Gulf Wind Technology are already taking advantage of the robust energy R&D ecosystem and infrastructure in South Louisiana to produce wind turbine products that support

18 U.S. Energy Information Administration. Total Energy Consumption Estimates per Capita by End-Use Sector, Ranked by State, 2020. *EIA: Independent Statistics and Analysis*. [https://www.eia.gov/state/seds/data.php?infile=/state/seds/sep\\_sum/html/rank\\_use\\_capita.html&sid=US&sid=LA](https://www.eia.gov/state/seds/data.php?infile=/state/seds/sep_sum/html/rank_use_capita.html&sid=US&sid=LA).

19 Energy-Related CO<sub>2</sub> Emission Data Tables. *EIA: Independent Statistics and Analysis*. [Online] October 11, 2022. [Cited: January 16, 2023.] Table 1.

State energy-related carbon dioxide emissions by year. <https://www.eia.gov/environment/emissions/state/>.

20 <https://www.rwe.com/en/press/rwe-offshore-wind-gmbh/2023-12-18-rwe-and-gno-signaling-further-market-readiness-along-the-gulf-coast/>

21 <https://oceantic.org/supplychain/>

hurricane resiliency and cost optimization in partnership with Shell. Nationally, NOWRDC has held 3 competitive solicitations, resulting in 52 projects across a range of technical challenge areas. However, even with this investment in the national portfolio, startups suffer from a lack of access to facilities and commercialization support that can advance their technologies – GLOW can attract these innovators to the local ecosystem by providing such support. Together, GLOW is connected to a significant pipeline of existing innovations that stand to greatly benefit from GLOW Innovation programming and resources and the Offshore Propeller Testbed.

**VIII. Sustainability Model:** Each GLOW component project has a respective set of sustainability mechanisms to ensure operations extend beyond the award period, which will be implemented in accordance with GLOW’s governance. In general, these mechanisms include managing revenues generated from facilities and equipment to sustain funding for the initiatives, coordinating governance with additional regional programs including FUEL NSF Engine and H2theFuture, and pursuing additional funding at industry, public, and philanthropic levels.

**VIII. Labor Standards:** According to NREL, a single 600-megawatt wind farm in the Gulf would produce 4,400 jobs during construction and \$445 million in economic output during the construction phase, 150 direct jobs with \$15M in annual economic impact. Occupations targeted by GLOW’s workforce development activities, such as wind turbine technicians trained through Nunez’s GWO-accredited program, are reported to have a median wage of \$57,320 annually, which is 75% above Louisiana’s current median – with demand expected to increase upwards of 45%making it one of the fastest growing occupations<sup>22</sup>. Though Louisiana is a right to work state, the aforementioned history of oil and gas workforce has created an ecosystem of highly competitive wages and stringent adherence to safety best practices. By involving industry partners including Edison Chouest Offshore, Morrison Energy, G.I.S., and Gulf Wind Technology, GLOW-supported workforce programs will integrate industry best-practices, required certifications and in-demand skills. Interestingly, due to the skills overlap between traditional energy and wind, both contractors and professionals can expand across energy fields. To ensure equitable awareness and access to these trainings, GLOW has partnered with 1881 to underrepresented populations start careers in engineering and technology through tailored apprenticeships with participating GLOW academic institutions and industry partners.

**IX. Equitable Impacts:** The challenge of decarbonization in the U.S. must be approached in a manner that embeds equitable development measures with value-driven and responsive practices that serve the needs<sup>23</sup> of underserved communities<sup>24</sup>. Generations of Louisiana’s workers and families have fueled America’s energy economy. Yet, many – particularly Black, Indigenous, and other People of Color (BIPOC) communities – have absorbed disproportionate negative impacts of fossil fuel extraction while being excluded from the economic benefits of the energy economy. In supporting a renewable energy sector that’s crucial to the State’s Climate Action Plan, **GLOW advances economic impact, while simultaneously addressing climactic and environmental threats impacting local communities**. This includes ensuring equity targets for industry growth and small business development are achieved: 35% of jobs created are in historically black communities, 20%in rural parishes, and 25% for displaced energy workers. Beyond investment and

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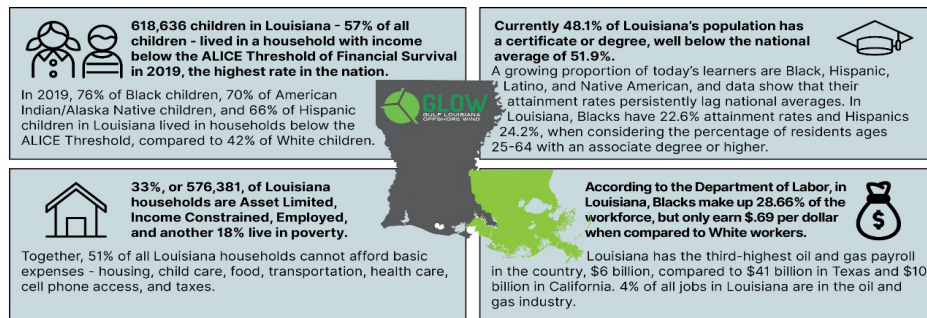
22 U.S. BLS: Fastest Growing Occupations

23 U.S. Environmental Protection Agency. Equitable Development and Environmental Justice. *U.S. Environmental Protection Agency*. [Online] November 14, 2022. [Cited: January 16, 2023.] <https://www.epa.gov/environmentaljustice/equitable-development-and-environmental-justice>.

24 Creating Equitable, Healthy, and Sustainable Communities: Strategies for Advancing Smart Growth, Environmental Justice, and Equitable Development. [Online] February 2013. [Cited: January 16, 2023.] <https://www.epa.gov/sites/default/files/2014-01/documents/equitable-development-report-508-011713b.pdf>.



job growth, GLOW will also decrease the region’s dependence on traditional energy jobs (refineries, petrochemical). The negative impacts of these facilities have particularly impacted the rural areas and communities of color in South Louisiana – rural and majority Black populations face 95% higher



health risks than most in the U.S.<sup>6</sup> Addressing this disparity by empowering diverse innovators and academics is key to GLOW Innovation, which will establish commercialization fellowships at HBCU

partners to support institutional capacity offshore building on technology topics for minority student populations. GNODF will extend its partnership with the Opportunity Hub NOLA(OHUB) Foundation to ensure diverse offshore wind entrepreneurs receive tailored startup support and investment through specialized cohorts of the New Energy Technology Incubator (NETI). Additionally, the 1881 Institute will recruit, train and support diverse talent enrolling in community college and four-year school wind-related curriculum.

**X.SMART Goals: (1) Commercialization of next-generation offshore energy technologies:** offshore wind innovations in the U.S. have been predominantly focused on floating technologies that enable deep water (>60m) development<sup>8</sup> – presenting a need to support overlooked technology constraints impeding national and global growth of OSW. **Output:** GLOW will support over 60 offshore energy technology prototypes over the funding period – 50% targeting Gulf of Mexico technical restraints, 50% national targets for offshore energy innovation. **Outcomes:** Creation of valuable intellectual property leading to new startups, partnerships with established energy companies, and domestic manufacture of these technologies to support domestic and global wind farms. Manufacturing operations are projected to establish up to 1,000 jobs per facility. **(2) Establish South Louisiana as a national test bed for offshore energy innovation:** by supporting innovators across the nation, GLOW will accelerate technologies that optimize wind farm performance and reduce cost. **Output:** Technologies drive U.S. competitiveness in global markets for offshore energy production – a key geopolitical strategy for the for the United States<sup>9</sup>. **Outcomes:** Domestic companies play a significant role in developing the 380GW of offshore wind capacity across thirty-two markets in the next ten years<sup>10</sup>. **(3) Regional, national economic development from OSW development and domestic supply chain utilization:** GLOW will accelerate offshore wind development in the Gulf of Mexico and similar markets globally, while providing cost reductions to national developments currently facing financial headwinds that risk their viability. **Output:** At least 9 offshore wind developments in the Gulf of Mexico enter their construction phase, leveraging Louisiana suppliers and the technologies commercialized through GLOW. The 11 additional projects expected to go online by 2029 have benefited from reduced project costs which yields lower power costs for respective ratepayers. **Outcomes:** The 9 GOM developments yield 40,500 construction and 1,400 permanent jobs with over \$4B in CAPEX; additional projects nationally represent an opportunity for 58,000 full-time works within the decade<sup>11</sup>.

**XI: Supporting Wider Economic Growth: Louisiana had the Sixth Largest Net Out-migration in 2023, which also marked its fourth consecutive year with population losses<sup>25</sup>.** There is a

consensus that a predominant driver is the continued job loss in the oil and gas industry – creating an immense need for new job creation in adjacent fields like offshore wind. In just five years, The State of Louisiana has announced 35 clean energy projects representing a total investment of \$45.6B in and the potential to generate 5,268 direct jobs with an average salary of \$79,900. These projects would also support 17,831 indirect jobs during construction. **Of these projects, 50.7% worth \$23.33B will rely on available renewable energy once operational, creating substantial demand for offshore wind energy**<sup>26</sup>. Louisiana is also among the most vulnerable states in the United States to the impacts of climate change – affecting the amount of coastal Louisiana that can be preserved despite unprecedented restoration efforts. This includes increased incidences of hurricanes, with the region’s most recent storms causing over \$84B of damage and over 116,000 residents losing their jobs. Coupled with a rapidly eroding coastline this has also affected the insurability of homes in the region, becoming one of the most critical impacts to the residents of South Louisiana. In supporting the State’s, nation’s, and globe’s decarbonization targets by catalyzing offshore wind development, GLOW can help Louisiana reverse its population decline and protect its most vulnerable communities.

**XII: Interim Activities:** The GLOW Tech Hub has acted upon its Tech Hubs designation to advance numerous key steps, which have enabled the consortium to proceed towards implementation activities: (1) Resolution from the State Mineral Energy Board to advance an operating agreement for the GLOW Offshore Propeller research and demonstration area. Worley is supporting implementation, ensuring the area is suitable for future wind turbine and offshore electrolysis demonstrations. (2) Gulf Wind Technology received approval by the Greater Lafourche Port Commission to advance Louisiana’s first research wind turbine at Port Fourchon. This will support research and workforce activities advanced by GLOW. (3) Alignment with the Future Use of Energy in Louisiana (FUEL) NSF Engine, which was recently awarded \$160M to further position Louisiana as a global energy transition leader and H2theFuture testbeds, which were established through the Build Back Better Regional Challenge (BBBRC). This includes shared governance and mutual support of technology areas of interest. (4) The inaugural Louisiana Wind Energy Week was produced by GLOW consortium members and key partners in January 2024 – advancing key conversations concerning the opportunities and challenges facing the development of a robust offshore wind industry in Louisiana as well as an energy innovation ecosystem workshop supported by Newlab to inform GLOW Innovation’s scope of work. (5) Since Phase 1, key industry partners including RWE, Vestas, SGRE, and Gulf Wind Technology confirmed that the Tech Hub would be most impactful if focused on the robust metocean data campaign, wider array of commercialization services, and virtual product development environment that can support a wider range of energy technologies. These activities were prioritized in place of a premature turbine demonstration, which will be advanced once prototype technologies are developed through GLOW’s projects proposed in this phase.