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The Digital Revolution: Electrification & Smart Communities
The Benefits and the Barriers
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Overview

This paper is a follow-up to the National Urban League's ("NUL") 2016 White Paper, *21st Century Innovations in Energy: An Equity Framework* and the *State of Black America 2018 Report—Powering the Digital Revolution* ("2018 State of Black America Report®"). In the 2016 White Paper we put forward an Energy Plan ("NUL Energy Plan"). In the 2018 State of Black America Report we discussed (1) the promise of the digital age, (2) the potential offered by the growth of smart communities, and (3) the need for League involvement in order to harness the enormous economic promise of the digitization of America.

The energy revolution we described in 2016 is continuing at a rapid pace. Today, energy plays as critical a role in the Digital Revolution, as does telecommunications. We have reached the point where each is dependent upon the other. Telecommunications is dependent upon energy for everything from powering their systems, to the poles on which many of the 5G antennas will be placed. Energy is dependent upon telecommunications as the vital part of the emerging smart grid. All are linked by Internet of Things ("IoT") technologies.

Beneficial or smart electrification—the adoption of more efficient electric end-use technologies—is occurring at an increasing rate.[1] Although the volume of electricity used throughout the country has remained relatively stable, electricity is being used as the power source for many more applications. This counter-intuitive proposition has resulted from the fact that beneficial electrification has led to the growing adoption of IoT energy management control and end-use appliances. This phenomenon of the increasing connection of applications and appliances *etc.* to the electric grid has been referred to as the "Integrated Energy Network" ("IEN") or the Energy IoT.[2]

The benefits of electrification and the IEN include facilitating both economic efficiency (*i.e.* lower costs) and energy efficiency (*i.e.* lower energy use). It has special benefits for consumers.

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[1] "Beneficial electrification" is defined as "the use of electricity in place of end-uses that directly combust fossil fuels, such as water heaters and electric vehicles." Keith Dennis *Beneficial Electrification for All Incomes,* Public Utilities Fortnightly at (June 1, 2018). Similarly, "smart electrification means using electrical energy to replace other forms of energy . . . It also means using the advantages electricity to make better overall use of energy." International Electrotechnical Commission. http://www.iec.ch/smartenergy/importance/ (last visited 4/20/2108).
[2] *See gen.* Electric Power Research Institute, *U.S. National Electrification Assessment* (April 2108) ("*EPRI Study*").

Beneficial electrification promotes economic development through job creation and retention, the development of community assets and improved productivity. It also offers environmental benefits in terms of emissions reductions and water usage.[3]

The electrification occurring throughout the United States has become a driving force in the growth of smart communities and will have a significant impact in both rural and urban areas. Among the benefits that African Americans may realize are access to new services, as well as increased employment and entrepreneurial opportunities. Electrification also offers particular benefits in the area of electric vehicle ("EV") transportation. However, job training will be a critical component if the potential benefits of electrification are to be realized. Likewise, the deployment of public charging EV networks throughout an entire locality will also be critical. These opportunities are not to be missed. It is the role of NUL to help ensure African Americans benefit both in terms of availability of services and economic opportunity.

There are important issues which must be addressed if African Americans are to harness the economic benefits of electrification including: (1) how can we ensure the deployment of smart energy infrastructure is done in a manner such that low and moderate income ("LMI") communities are served on a universal basis and at reasonable rates; (2) how wherever possible can we ensure that markets are open to all responsible suppliers, including incumbent electric companies and solar companies; and (3) how can we ensure, establish, or promote the training and other incentive programs necessary to spur employment and supplier diversity in this area?

1. Electrification

As previously noted, driven primarily by innovation in IoT technologies, electrification is occurring at an increasing rate. Customers are continuing to increase their reliance on electric end uses. According to a study by the Electric Power Research Institute ("EPRI") in the United States electricity has grown from 3% of final energy use in 1950 to approximately 21% and may grow to 47% by 2050.[4]

Electric companies are investing over $100 billion annually in deploying smart infrastructure and developing renewable sources of energy. Seventy-three percent of electric utilities are either implementing or developing grid modernization plans—this has increased from 52% in 2017.[5] This investment will allow the effective integration of IEN networks—linked and/or monitored by telecommunications. This will in turn spur the growth in the reliance on clean renewable power, such as community solar, as well as the deployment of microgrids as was discuss in the NUL Energy Plan. Moreover, this investment will also enable electric companies to provide individualized customer solutions.

Electrification will spur the growth of the green economy through a reduction in energy consumption as more efficient electric load grows and greenhouse gas emissions are reduced. For example, due to technical advances including, but not limited to, cooler LED lighting systems, smart heat pumps, smart meters, smart appliances, smart to better sensors, dynamic

[3] Kenneth W. Costello *"Electrification: the nexus between consumer behavior and public policy"* The Electricity Journal 31 at 2 (2018) ("Costello")
[4] *EPRI Study* at 7
[5] Bridge Energy Group, *2018 Bridge Index Utility Industry Survey* at 8 (2018)

thermostats and other technologies, it is now possible to increase energy efficiency in urban buildings and elsewhere thereby reducing heat loss, better managing load, and reducing peak demand charges. This has the potential to significantly lower energy demand while at the same time improving the quality of life.

Much of the growth in electrification, and as a result many of its benefits, will accrue from growth in smart transportation.[6] EVs, particularly mass transit EVs, are becoming more competitively priced and growing in number as battery prices decline, as opposed to the relatively stable cost of combustible engines. As the Staff of the Maryland Public Service Commission found, if managed properly, EV transportation offers real opportunities as the EV market share is expected to grow significantly in the next decade.[7] Approximately 840,000 EVs were on the road in the United States through April 2018 and sales are continuing at this momentum.[8] Such widespread adoption will reduce harmful health and environmental effects of automotive transportation which detrimentally affects urban communities.[9] However, as the use of EVs grows so will the need for the wide deployment of charging infrastructure.

In particular, there are tremendous gains to be made as more mass transit EVs are deployed. In addition to transit buses, other suitable candidates for electrification include delivery trucks, and off-road equipment.[10] Consequently, it would appear that a major shift toward electrification is underway in the medium and heavy-duty truck sector. Large and municipal corporate fleets are evaluating opportunities to electrify their operations.[11] According to a report by the Union of Concerned Scientists "[e]specially well-suited for EVs are fleet vehicles operating on defined routes with predictable stops and housed at central depot locations where vehicles can be recharged . . . The high on-road time of fleet vehicles compared with passenger vehicles also means that the fuel and maintenance savings of electrification accrue much faster."[12] There are similar gains to be made as EV ride sharing takes hold.

It is important to prioritize EV access in underserved communities because such areas can benefit the most from the clean air and cost-saving benefits of EVs.[13] These communities should not be relegated to being passive or potential users of EVs. Residents of LMI and communities of color are more likely to live near busy roads and freight hubs, where exposure to pollution

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[6] " There is a clear case for electrifying transportation, which can provide benefits to all consumers (including the socioeconomically disadvantaged), advance economic development, create jobs, provide grid services, integrate more renewable energy, and cut air pollution and greenhouse gases.) Transportation Electrification Accord at 1(launched 11/9/2017 updated 8/20/18)

[7] Maryland Public Service Commission Staff, Petition for Implementation of a Statewide Electric Vehicle Portfolio, Case No. 9478 at 2 (January 18, 2018) ("*Maryland EV Petition*")

[8] Edison Electric Institute, EV Trends & Key Issues at 1 (June 2018) ("*EV Trends & Key Issues*").

[9] Notice, *In The Matter of Transforming Maryland's Electric Distribution Systems To Ensure That Electric Service Is Customer-Centered, Affordable, Reliable and Environmentally Sustainable in Maryland*, at 2 (Maryland Public Service Commission PC 44 January 31, 2017). ("*MDPSC Report*")

[10] Transportation Electric Accord at 1.

[11] *EV Trends & Key Issues* at 3.

[12] Union of Concerned Scientists, *Delivering Opportunity—How Electric Buses and Trucks Cam Create Jobs and Improve Public Health in California* ("*Delivering Opportunity Report*")

[13] Greenlining Institute, Electric Vehicles for All: An Equity Toolkit, http://greenlining.org/publications-resources/electric-vehicles-for-all// (last visited 4/24/2018).

from heavy-duty vehicles and freight is greater.[14] Furthermore, these residents are more likely to be renters and/or live in multi-unit dwellings and not have access to residential charging stations. According to the National Renewable Energy Laboratory" [w]hile the majority of present day PEV charging occurs at residential locations, high density parking and housing environments present challenges for urban PEV owners, particularly those living in multi-unit dwellings . . .[15] These individuals would presumably be reliant on workplace charging and public networks to satisfy the majority of charging needs."[16] A significant expansion of the traditional EV charging infrastructure is required if these needs are to be met.

Similarly, EVs present a good option for drivers who earn money in ride-hailing through Transportation Network Companies ("TNC") and for their customers—particularly those in underserved areas. TNC drivers could operate from community hubs where charging stations had been installed. This could provide their customers with ready access.

Likewise, community EV hubs could be used as the locus for car-share services, in which members are able to rent an EV for short periods of time in order to run errands or for other short trips.[17] However, once again the availability of public charging infrastructure is critical if these potential opportunities are to be realized.

2. Smart Communities

Spurred by the possibilities enabled by beneficial electrification combined with innovation in telecommunications and IoT technologies, smart communities are growing throughout all parts of the United States with the goals of, among other things, creating new jobs, expanding mobility options, enabling economic opportunities, improving citizen well-being, reducing the environmental impacts of transportation, public safety, introducing more efficient technology and developing new ways to cut costs. As noted in the 2018 State of Black America Report smart communities represent a fertile ground for economic development. Many economic opportunities will arise across the new urban landscape.[18]

At its basic level, using data analytics, smart community cloud-based platforms connect devices and collect, combine, and manage data from different city domains and service providers to provide a unified view of a city.[19] Smart communities include smart transportation, smart street lightning, smart buildings, monitoring, energy efficiency, distributed energy resources such as microgrids and battery storage, other customer energy monitoring and utilization apps.

Not only are all of these dependent upon electricity, but "if the power grid goes down, the water supply is reduced, or roads are cut off, the effect ripples through an entire urban area and can cripple the operations of schools and businesses as well as impact public safety and

[14] *Delivering Opportunity Report* at 10.
[15] PEV stands for Plug-in Electric Vehicle.
[16] National Renewable Energy Laboratory, *Meeting 2025 ZEV Goals: An Assessment of Electric Vehicle Charging Infrastructure in Maryland* at 14-15 (Draft Report submitted in Case No. 9478) (March 2018).
[17] *Maryland EV Petition* Appendix H at 156.
[18] Don Cravins Jr., 2018 State of Black America, Smart Cities, Inclusive Growth: Harnessing the Enormous Economic Promise of Next Generation Networks.
[19] *See gen.* IDC Technology Spotlight, *The Power of the Platform in Smart Cities* (June 2017). ("*IDT Spotlight*")

health."[20] However, if these separate systems are proactively coordinated and supported with integrated data, the benefits can improve the entire city.

More positively, smart electric infrastructure will promote public safety and improvement in the quality of urban life through the deployment of smart street lights and stop lights. This will improve the coordination of traffic and general emergency response time. Likewise, smart buildings, battery storage, and other heating and cooling technology (smart thermostats, water heaters, meters, washers and dryers etc.) will not only help reduce energy costs but also will have environmental benefits.

Similarly, EVs, particularly transit and ride-sharing ones, also offer real benefits in smart communities. Consequently, in terms of EVs, the electrification of public transportation and school buses should take the highest priority.[21] On the other hand, EV cars represent a longer-term opportunity.

There will be significant economic opportunities in the EV infrastructure service area in terms of both jobs and supplier diversity. Companies and individuals will be needed to install charging infrastructure, provide repair and retail services, and upgrade the electricity grid. They will also be needed to implement various smart, clean energy upgrades to help consumers make conservation decisions that save energy and money and provide tangible clean air and health benefits.[22] Much of this can and should be done by diverse businesses with a track record of hiring individuals living in their respective communities. Moreover, training programs will be necessary since in large part, these are new jobs that will require new skills.

Even agriculture will benefit through the use of new electric powered technology. For example, ultraviolet light can be used to cleanse water.[23] Electricity is now being used not only to provide light for indoor agriculture, but also to power applications for climate control and the monitoring of crops and animals both indoors and outdoors. It is also used for agricultural pumping.[24]

Energy companies and communities are already beginning to work together in efforts to deploy smart community infrastructure in a number of urban areas. For example, in Atlanta, Georgia Power is upgrading 36,000 street lights leased to the city with LED fixtures and has installed EV charging stations a part of a statewide initiative. Further, working along with the city and other entities, Georgia Power has partnered to pilot a sensor platform which, in addition to 1,000 wirelessly controlled LED lights, will have networked sensors to provide information on traffic congestion, crime, and emissions.

In Baltimore, the Baltimore Gas and Electric Company ("BGE") is partnering with the city and others to convert all streetlights to energy saving LEDs, to support efforts to install

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[20] *Id*. at 3.
[21] Jenifer Bosco, John Howat, and John W. Van Alst, *A Consumer Advocate's Perspective on the Future of Transportation Electrification* at 93 (Berkeley Lab, *the Future of Transportation Electrification: Utility, Industry and Consumer Perspectives*, August 2018).
[22] Greenlining Institute, *Electric Vehicles—who's left stranded,* at 11 (2011).
[23] Public Utilities Fortnightly PUF 2.0, *Future is Now in North Carolina*, at 34 (Mid-February 2018)
[24] Costello at 1.

6,000 new pedestrian street lights throughout the city, and to install EV charging stations. BGE completed its smart meter deployment several years ago which has not only improved outage restoration but also facilitated energy savings programs. Additionally, BGE, PEPCO and First Energy have proposed building a statewide EV charging network.

Smart communities' deployment efforts are also moving forward in Chicago. ComEd is piloting the implementation of off-grid street lights powered by wind turbines, solar panels, and batteries. The Chicago Transit Authority is planning to add 30-40 electric buses to its fleet. ComEd is also engaged in the "Array of Things" project which will install 500 sensor nodes around the city and capture environmental, air quality, light and infrared information.

Denver has entered into a "Joint Energy Efficiency Program" with Xcel Energy to establish target goals for city energy reduction efforts. The city has installed twelve charging stations throughout the city. Xcel partnering with Denver and Panasonic is conducting a battery storage demonstration program testing the ability of high-capacity batteries to provide energy grid services.

These are a few of many examples. Others include Kansas City Power & Light which has installed approximately 900 EV charging stations, Florida where Florida Power & Light has partnered with a number of commercial and governmental customers to install distributed solar projects and Louisville where 15 electric buses are operating. Similar efforts are taking place in Columbus, New York, Pittsburg, Phoenix and San Diego.

3. Moving Forward

As we noted in the 2018 State of Black America Report, we are doomed to repeat history unless we are able to both participate more fully in and benefit more fully from all of the opportunities arising from the new digital technologies. African Americans must be able to share the benefits of the electrification. We must ensure African American communities are not redlined and that smart infrastructure and technologies (*e.g.* EVSEs, smart lights etc.) are deployed in all communities.

There are four main barriers which must be addressed if the particular benefits of electrification are to be realized. First, there are technical and infrastructure barriers caused by things such as insufficient charging infrastructure deployed throughout a city. Second, there are significant policy and regulatory barriers. Third, there are economic barriers generally involving high upfront costs of replacement technologies. Finally, there are social and economic barriers primarily relating to lack of customer awareness and inertia, the lack of job readiness, and/or the failure to establish aspirational or binding goals to achieve certain levels of deployment, employment and emissions reductions.[25]

State and local utility regulators have an important role to play as both facilitators and decision makers.[26] With respect to EVs, there are six basic questions before them: (1) how much EV charging infrastructure and grid investment is needed to support smart community

[25] *See gen.* Synapse, *Northeastern Regional Assessment of Strategic Electrification* at 14 (2017).
[26] Phillip R. Jones, *A Utility Perspective on the Future of Transportation Electrification* at 3 (Berkeley Lab, *The Future of Transportation electrification: Utility, Industry and Consumer Perspectives*, August 2018).

applications including, but not limited to, street lights, EV charging infrastructure; (2) how can regulators ensure equal access to charging infrastructure and other smart community innovations; (3) should energy companies be permitted to fully participate in the EV market to ensure widespread penetration; (4) how should the costs and benefits of investment in grid upgrades and EV charging structures be assessed so as to avoid LMI communities subsidizing wealthier communities; (5) how can programs be designed to maximize consumer benefits; and (6) how should the costs of these investments be recovered?

At a minimum, utility regulators must make sure that EV and all energy service related prices are affordable and costs properly distributed; that the electric grid is operating efficiently, reliably and safely; that smart infrastructure is deployed; and that EV service is available in all neighborhoods. As a start, state utility regulators should consider whether rate designs need to be modified in order to encourage the universal deployment of smart energy infrastructure.

More generally, as was discussed in the NUL Energy Plan, in their effort to encourage the use of new sources of energy or the deployment of new services, regulators must "work to ensure electric rates are fair and affordable for all customers and that all neighborhoods and customers receive the benefits and share the costs of the energy transformation regardless of the technology used . . ."[27] Regulators must consider the costs of investment or sources of supply and act to minimize the impact on low-income consumers and late adopters in order to avoid inequity.[28] This is a problem with which regulators are currently dealing in connection with the deployment of distributed energy resources ("DER") and the possibility that as a result said deployment, certain costs may be "stranded" to the detriment of poorer ratepayers.[29] "[W]hen customers reduce their usage or other billing/rate recovery determinants, costs that were previously collected from those customers (or investments previously made to serve them) may be stranded, at least in the short term to mid-term until rates are reset."[30] In such a situation, DER consumers may not be paying their full share of the costs of investments in generation, transmission and distribution assets which serve all customers alike.[31] Consequently until such time as regulators take action, these costs are collected from other customers—a burden which might unduly fall on LMI communities.[32]

State and local officials also have critical role to play.[33] These officials, along with state utility regulators, must take responsibility for establishing and/or promoting the supplier diversity and skills training programs necessary to ensure that LMI communities and people of color fully participate and receive the economic benefits of electrification. Likewise, they must

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[27] NUL Energy Plan at 9.

[28] *See* Adrienne L. Thompson, *Protecting Low-Income Ratepayers as the Electricity System Evolves*, 265, 281 Energy Bar Journal (11/11/16).

[29] Stranded Costs are costs that the operator has properly incurred and that the operator does not have a reasonable opportunity to recover given the introduction of competition or some other (unanticipated) policy change . . . Thus, stranded costs represent lost revenues or reductions in asset values experienced by a regulated firm when new policies alter a well-defined regulatory contract. The utility will seek to recover those costs from remaining customers in the new policy environment. http://regulationbodyofknowledge.org/glossary/s/stranded-costs/ (last visited 9/27/2018)

[30] NARUC Staff Subcommittee on Rate Design, *Distributed Energy Resources Rate Design and Compensation* at 84-85 (November 2016) ("NARUC Manual").

[31] *Id.*at 89.

[32] Id. at 84.

[33] *See* Transportation Electrification Accord at 1.

take responsibility for supporting and incentivizing the deployment of smart community infrastructure. With regard to EVs, these officials must consider how to ensure equitable access to electric vehicle infrastructure and charging incentives, especially to traditionally under-served communities. One means by which to do so is by promoting the adoption of EV fleets by large corporations, municipalities and organizations; promoting workplace charging; and partnering with state agencies and other stakeholders to speed adoption of tariffs and other measures. Another would be by promoting the deployment of widespread public fast charging EV charging networks.

Under appropriate rules, electric companies should be permitted to fully participate because at this moment in time only they have necessary scale and obligation to serve all.[34] Regulators should avoid constructing artificial barriers.[35] This will not, nor should preclude non-utility entrants.[36] According to the Maryland Public Service Commission allowing some level of utility involvement in the build-out of EV infrastructure could catalyze the private market, as well as electric vehicle ownership generally.[37]

There are a number of advantages in allowing energy companies into the EV charging market, including the ability to ensure that the investment in the grid upgrades necessary to support EV charging infrastructure is made, the EV charging stations operate efficiently on the gird, and that the EV charging infrastructure does not disrupt the local grid. Additionally, energy companies: (1) can bring EVs to communities that may not otherwise have access; (2) can support public build out of EV charging infrastructure that can be used also for car-sharing and ride-hailing programs; (3) can help to accelerate the EV adoption through increasing customer awareness, lowering cost of installing charging infrastructure; (4) have the ability to charge fees based on the amount of electricity consumed as well the ability to give credit; and (5) have the ability to charge to a customer's account. Therefore, allowing some level of utility involvement in the build-out of EV charging infrastructure and services could catalyze the private market, as well as electric vehicle ownership.

4. The Role of the National Urban League and its Affiliates

As stated in the 2016 NUL White Paper, the role of the National Urban League and its affiliates in ensuring that African Americans receive the full benefits of electrification and live in smart communities is straightforward. First and foremost, we must actively advocate at the federal, state and local levels to ensure that our communities become "Smart" and that these communities receive all of the benefits of electrification at fair and reasonable prices. We must

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[34] As part of what is known as the "regulatory compact" electric utilities are required to provide universal service at reasonable rates and in the most efficient and effective way possible. *See e.g.* Sara Harari, Ben Bovarnick, *Electricity Evolution: Meet the Ringmasters,* Clean Energy Finance Forum (Yale Center for Business and the Environment 9/20/2017).

[35] *See* Costello at 4 ("An artificial barrier includes regulatory rules that unduly discourage electric utilities from promoting electrification.")

[36] Kathryn A. Zyla, *Discussion Paper: Charging Ahead—Options for Policymakers Regarding the Regulation of Electric Vehicle Charging Markets* at 7 (June 2014).

[37] Notice, *In The Matter of Transforming Maryland's Electric Distribution Systems To Ensure That Electric Service Is Customer-Centered, Affordable, Reliable and Environmentally Sustainable in Maryland*, at 8-9 (Maryland Public Service Commission PC 44 January 31, 2017).

educate and promote discussion around these opportunities throughout the United States. We must work with cities to establish smart communities.

NUL and the 90 Urban League Affiliates will continue to build and strengthen partnerships with energy companies, educational institutions, our affiliates, and others to promote training programs. Finally, we will continue to work with industry and government entities to promote not only jobs, but also meaningful diverse supplier business opportunities.

The activities of the Pinellas County Urban League ("PCUL") serve as a powerful example of the impact the Urban League Movement has and could have in the energy space. Understanding the career opportunities and need for diversity in the energy sector, the PCUL partnered with Duke Energy of Pinellas County (Duke Energy) to conduct diversity recruitment for Duke Energy's Electrical Line Worker Division. Both PCUL and Duke Energy sought to ensure Duke Energy's Line Worker Division more closely represented the communities in which it services.

Together, the two organizations leverage their strengths PCUL—utilizing its deep community connections to advertise and host an informational session on the opportunities of an electrical line worker and Duke Energy providing speakers to meet with applicants, explain the scope of work, job requirements and benefits to attendees. To ensure this innovative program's success, PCUL designed a boot camp to prepare attendees for work in this sector.

At the boot camp, PCUL conducts an initial screening to select qualified and able attendees to participate in the boot camp. The screening is based on criteria provided by Duke Energy and the boot camp is designed to help prepare the attendees for the application process. The preparation is an all-day event consisting of CAST (Construction and Skilled Trade Test) preparation, mock interviewing, and PAT (Physical Abilities Test) demonstrations. Duke Energy sponsors the event, provides breakfast and lunch for all participating attendees. Once the application process formally opens, the boot camp attendees are encouraged to apply to Duke Energy and provided with any necessary assistance to do so.

Since 2015, PCUL's program has enabled 31 diverse men and women an opportunity to take part in this important and growing industry. For those 31 individuals and those to come after them, PCUL's program provides more than just jobs, but a genuine opportunity to start and excel in a lifelong career opportunity. This program is an excellent example of how NUL and its affiliates are able to partner with industry and government, to build scalable programming with direct and lasting results.

5. Conclusion

In conclusion, our action plan for the future will be to continue implementing the NUL Energy Plan. The Plan is focused on the following key areas of interest:

1. **Jobs:** To advocate for and work with a diverse set of stakeholders including labor organizations, the Center for Energy Workforce Development, the oil and natural gas industry, and the renewable energy sector to promote meaningful skills development, technical training, internships and job placement opportunities for African Americans and urban community members.

2. **Diversity:** To develop written community-based diversity plans that clearly define measures for success advancing diverse employment across all levels and sectors of the energy industry including in its C-Suites, Boards and outside consultants.

3. **Ownership:** To promote entrepreneurial activities, not just in the traditional fields of construction and procurement, but also in other areas by expanding utility MOU programs and developing financing mechanisms.

4. **STEM:** To develop and promote programs which lead to jobs and ownership through partnerships among utilities, energy companies, HBCUs, NUL affiliates and others. To lend our advocacy for a broader definition of STEM that works to educate and engage diverse communities about the critical importance of STEM—as fields of study, in related career opportunities, and through practical application with a focus on all disciplines that incorporate science, technology, engineering and math.

5. **Ubiquitous Service:** To work to ensure that electric rates are fair and affordable for all customers and that all neighborhoods and customers receive the benefits and share the costs of the energy transformation regardless of the technology used.

6. **Housing:** To work in conjunction with NUL affiliates, utilities and energy companies to promote increased funding for LIHEAP, the broader utilization of energy efficiency programs, and the development in all communities of projects such as solar gardens, microgrids and EVs.

7. **Environmental Justice:** To promote energy policies that fairly and meaningfully involve all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies ensuring African Americans have access to clean and healthy environments.

8. **Renewable Energy:** To recognize renewable energy as a vital part of an overall energy strategy that recognizes all sources of energy. To promote the expanded utilization of renewable energy in a manner which ensures that its benefits are shared, promotes jobs, builds local economies, address environmental concerns and reduces overall energy costs.

9. **Consumer Protection:** To educate consumers on energy issues and advocate for increased consumer protections.

10. **Supplier Diversity:** To proactively promote business programs that encourage the use of African American owned businesses as suppliers of goods and services. These programs and policies should emphasize the creation of a diverse supply chain that ensures the inclusion of diverse groups in the procurement plans for the entire energy industry.