

# SDG 7: AFFORDABLE AND CLEAN ENERGY

by Elizabeth Kronk Warner and Uma Outka

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## SUMMARY

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In 2015, the United Nations Member States, including the United States, unanimously approved 17 Sustainable Development Goals (SDGs) to be achieved by 2030. In a forthcoming book, leading legal scholars examine each of the SDGs and recommend a suite of government, private-sector, and civil society actions to help the United States achieve these goals. This Article is adapted from Chapter 7 of that book, *Governing for Sustainability* (John C. Dernbach & Scott E. Schang eds., ELI Press, forthcoming 2023).

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### I. Introduction

Goal 7 of the Sustainable Development Goals (SDGs) calls on countries to ensure access to affordable, reliable, sustainable, and modern energy for all.<sup>1</sup> Specifically, Goal 7 announces the following targets relevant to every nation:

- 7.1 By 2030, ensure universal access to affordable, reliable, and modern energy services.
- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.
- 7.3 By 2030, double the global rate of improvement in energy efficiency.

This Article examines these targets in Goal 7 (see Box 1 for all targets), with a specific emphasis on the development of clean and renewable energy and on ensuring universal access to clean energy (including energy efficiency). The Article focuses on these aspects of Goal 7, as much of the world has access to some form of energy but most is still fossil-based. The development of renewable energy thus presents the opportunity for both clean and sustainable energy moving forward. As one of the world's most significant energy consumers and greenhouse gas (GHG) emitters, this shift within the United States is essential.

The Article begins with an introduction to global progress on Goal 7, and then addresses progress that has been made in the United States and offers recommendations for how governmental and private entities should advance renewable energy development within the United States.

Next, the Article considers ways to increase energy access and affordable energy in the United States, with special attention to household energy burden in the clean energy transition. Ultimately, the recommendations laid out in this Article should lead to more rapid progress toward the targets of Goal 7.

### II. Progress

Although countries around the world are making progress on Goal 7,<sup>2</sup> at the current pace, the goal will not be met by 2030.<sup>3</sup> While a shift is underway toward more sustainable resources, such as renewable energy, the majority of this progress has been made in the electricity sector.<sup>4</sup> More progress must be made in the transportation and heating sectors to meet the established targets.<sup>5</sup> Similarly, progress is also being made in improving energy efficiency, but not quickly enough to meet the SDG target.<sup>6</sup> Accordingly, the United Nations (U.N.) concludes “governments will need to set their energy efficiency ambitions higher.”<sup>7</sup> Although

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1. G.A. Res. 70/1, Transforming Our World: The 2030 Agenda for Sustainable Development, U.N. Doc. A/RES/70/1, at 14 (Oct. 21, 2015) [hereinafter 2030 Agenda], [https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A\\_RES\\_70\\_1\\_E.pdf](https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf).

2. Increasingly, however, energy is more widely available across the world, and more sustainable sources are being used. In 2017, 89% of the global population had access to electricity, or approximately nine out of every 10 people. See United Nations (U.N.) Department of Economic and Social Affairs, *Goal 7: Affordable and Clean Energy*, <https://unstats.un.org/sdgs/report/2019/goal-07/> (last visited June 21, 2022). However, rural communities still lack appropriate access, as “87 per cent of the people currently without electricity live in rural areas.” *Id.*

3. U.N., THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2020 [hereinafter SDGs REPORT 2020], <https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf>.

4. See U.N. Department of Economic and Social Affairs, *supra* note 2. Unlike electricity, the progress toward moving the global population to clean cooking fuels and technologies has been too slow to meet the SDG by 2030. *Id.*

5. SDGs REPORT 2020, *supra* note 3.

6. See U.N. Department of Economic and Social Affairs, *supra* note 2.

7. *Id.*

### Box 1. Goal 7 Targets

- 7.1 Ensure universal access to modern energy
- 7.2 Increase global percentage of renewable energy
- 7.3 Double the improvement in energy efficiency
- 7.a Promote access, technology, and investments in clean energy
- 7.b Expand and upgrade energy services for developing countries

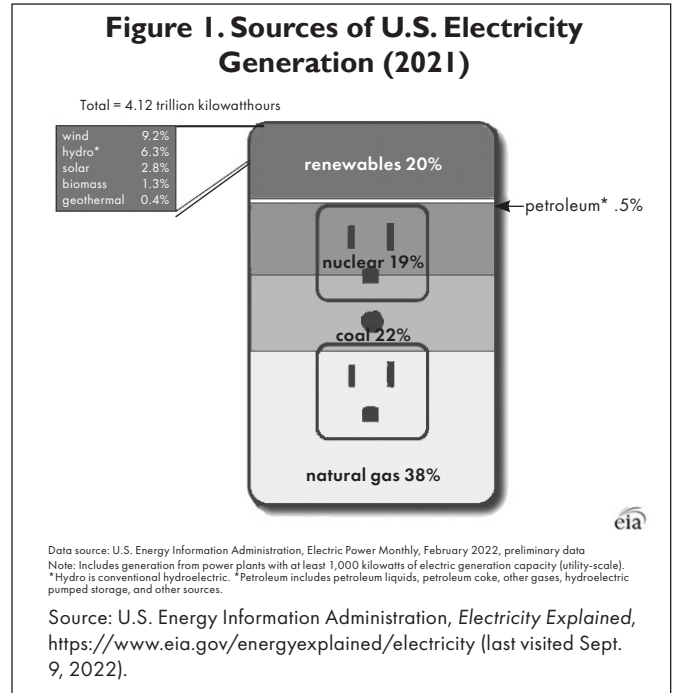
Source: SDG Tracker, Sustainable Development Goal 7, <https://sdg-tracker.org/energy>.

there has been a significant increase in international financing for clean and renewable energy development across the world, “only 12 per cent of these financial flows reached the least developed countries, which are the farthest behind in reaching Goal 7 targets.”<sup>8</sup>

COVID-19 may have an impact on global progress toward Goal 7.<sup>9</sup> With respect to Goal 7, the U.N.’s *Sustainable Development Report 2020: The Sustainability Development Goals and COVID-19* anticipated that the “slowdown in economic growth contributing to a reduction in energy prices . . . might increase access to energy but reduce incentives for renewables.”<sup>10</sup> Also, the report calls on nations to refocus economic recovery on infrastructure investments, which directly implicates Goal 7.

The United States has made some progress toward achieving Goal 7. One hundred percent of the U.S. metropolitan population has access to electricity and clean cooking, which aligns with Target 7.1, but the high energy burden in low-income households is a threat to consistent energy access for many Americans.<sup>11</sup> As of 2021, 20% of electricity was generated from renewable resources in the United States, compared with 12% of the total final energy consumption, which contributes to progress toward Target 7.2.<sup>12</sup> Overall, the U.S. electricity system is close to 40% carbon-free, when current levels of renewable generation are combined with existing nuclear power plants.<sup>13</sup> Also, as of 2017, the energy efficiency in the United States exceeded the global average,

which aligns with Target 7.3.<sup>14</sup> See Figure 1 for sources of U.S. electricity generation and Figure 2 for sources of energy consumption.



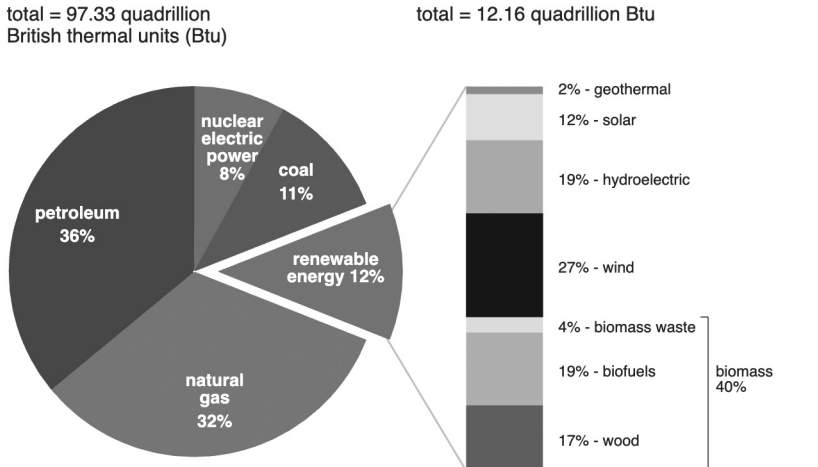
Despite these accomplishments, however, the United States has yet to achieve affordable clean energy for all. The United States still has several essential unmet goals,<sup>15</sup> such as increasing renewable and other clean energy resources in the total U.S. primary energy supply, which would also have the effect of reducing GHG emissions from fuel combustion for electricity and heating. The United States must also further improve its energy efficiency; the energy that is not used is the cheapest and least polluting energy of all. Another unmet goal is ensuring the energy burden is not excessive for low-income people and does not affect people of color disproportionately.

Since taking office in January 2021, President Biden has been working to meet these unmet goals. Importantly, the president announced a “new target for the United States to achieve a 50-52 percent reduction from 2005 levels in economy-wide net greenhouse gas pollution in 2030” and also established a goal of reaching net-zero emissions across the U.S. economy by 2050.<sup>16</sup> The Administration intends to accomplish both goals in a manner that is consistent with environmental justice.<sup>17</sup> According to the Administration, these initiatives can be accomplished through the production and deployment of clean energy,

8. SDGs REPORT 2020, *supra* note 3.  
 9. JEFFREY SACHS ET AL., SUSTAINABLE DEVELOPMENT REPORT 2020: THE SUSTAINABLE DEVELOPMENT GOALS AND COVID-19, at 4 (2020).  
 10. *Id.* “At the same time, the crisis is certain to stymie efforts towards Goal 7. Disruptions in supply chains could wreak havoc on energy services, and reduced incomes could limit people’s ability to pay for them. In addition, plummeting oil prices are likely to discourage growth in renewable energy.” SDGs REPORT 2020, *supra* note 3, at 38.  
 11. Tracking SDG 7, *United States of America*, <https://trackingsdg7.esmap.org/country/united-states-america> (last visited June 21, 2022). *But cf.* Laurie Stone, *Native Energy: Rural Electrification on Tribal Lands*, RMI, June 24, 2014, [https://rmi.org/blog\\_2014\\_06\\_24\\_native\\_energy\\_rural\\_electrification\\_on\\_tribal\\_lands/](https://rmi.org/blog_2014_06_24_native_energy_rural_electrification_on_tribal_lands/) (“The Energy Information Administration estimates that 14 percent of households on Native American reservations have no access to electricity, 10 times higher than the national average.”).  
 12. See U.S. Energy Information Administration (EIA), *Electricity Explained* [hereinafter EIA image], <https://www.eia.gov/energyexplained/electricity/> (last updated Apr. 19, 2022) (see image titled “Sources of U.S. electricity generation, 2021”); *Renewables Account for Most New U.S. Electricity Generating Capacity in 2021*, EIA, Jan. 11, 2021, <https://www.eia.gov/todayinenergy/detail.php?id=46416>.  
 13. See EIA image, *supra* note 12.

14. Tracking SDG 7, *supra* note 11.  
 15. See Box 1 for targets.  
 16. Fact Sheet, The White House, President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Jobs and Securing U.S. Leadership on Clean Energy Technologies (Apr. 22, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>.  
 17. *Id.*

**Figure 2. U.S. Primary Energy Consumption by Energy Source (2020)**



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2022, preliminary data  
 Note: Sum of components may not equal 100% because of independent rounding.



Source: U.S. Energy Information Administration, *Renewable Energy Explained*, <https://www.eia.gov/energyexplained/renewable-sources/> (last visited Sept. 9, 2022.)

that environmental justice and prioritizing investment to benefit communities of color and lower socioeconomic communities will go a long way toward ensuring that the energy burden does not continue to negatively impact these groups.<sup>23</sup> The NDC identifies pathways through various sectors, such as electricity, transportation, buildings, industry, and agriculture and lands, to meet its major goal of reductions by 2030, reiterating the goal of “100 percent carbon-pollution-free electricity by 2035.”<sup>24</sup>

This Article addresses the two key components of Goal 7 in turn—clean energy and affordable energy—and summarizes key developments in law and policy at the federal, state, local, and tribal levels. It also addresses strategies for ensuring that these two objectives are achieved at the same time and presents recommendations for these various governments to make additional progress toward achieving the twin aims of Goal 7. The Article focuses on the

which includes achieving “100 percent carbon pollution-free electricity by 2035,” “cut[ting] emissions and energy costs for families by supporting efficiency upgrades and electrification in buildings,” “reduc[ing] carbon pollution from the transportation sector,” “address[ing] carbon pollution from industrial processes,” and “invest[ing] in innovation.”<sup>18</sup> As an example of how the Administration will support these initiatives, the U.S. Department of Energy has announced a \$100 million investment in “transformative clean energy solutions.”<sup>19</sup>

The targets announced by the Biden Administration are reflected in the commitments made by the United States in its nationally determined contribution (NDC) submitted in April 2021.<sup>20</sup> Because the United States has reentered the Paris Agreement, it submitted a revised NDC. The NDC reiterated to the world the national aim to reduce GHG emissions by 50%-52% below 2005 emissions across the U.S. economy by 2030.<sup>21</sup> This is notably more ambitious than the first U.S. NDC submitted under President Obama, which aimed for reductions of 26%-28% below its 2005 level in 2025.<sup>22</sup> The new NDC goes on to recognize

development of clean energy—that is, renewable energy and energy efficiency—because, although many around the world have access to some energy form, it is often highly polluting, which perpetuates a disparity between socioeconomic groups around the world and exacerbates existing vulnerabilities.

### III. Accelerating Clean Energy in the United States

Targets 7.2 and 7.3 call for a substantial increase in renewable energy generation by 2030 and a doubling of the rate of improvement in energy efficiency, respectively.<sup>25</sup> The United States is positioned to make significant progress toward the goal of clean energy for all by aggressively increasing renewable energy from the current 20% of electricity generation and pursuing a wide-ranging mix of efficiency measures to reduce energy consumption. This goal intersects particularly with Goal 9 (Industry, Innovation, and Infrastructure), Goal 11 (Sustainable Cities and Communities), and Goal 13 (Climate Action). There is a role for federal, state, tribal, and local governments, as well as the private sector, to make progress toward achieving each of these targets in the United States by 2030.

At the federal level, the Biden Administration’s goal of achieving carbon-free electricity by 2035 can be a driving force for policies within the executive branch to facilitate utility-scale renewable energy project development. See Figure 3 for information on planned utility-scale capacity additions. In Executive Order No. 14008, the president out-

18. *Id.*  
 19. Press Release, U.S. Department of Energy, DOE Announces \$100 Million for Transformative Clean Energy Solutions (Feb. 11, 2021), <https://www.energy.gov/articles/doe-announces-100-million-transformative-clean-energy-solutions>.  
 20. THE UNITED STATES OF AMERICA NATIONALLY DETERMINED CONTRIBUTION, REDUCING GREENHOUSE GASES IN THE UNITED STATES: A 2030 EMISSIONS TARGET (2021), <https://unfccc.int/sites/default/files/NDC/2022-06/United%20States%20NDC%20April%2021%202021%20Final.pdf>.  
 21. *Id.*  
 22. The United States of America, First Nationally Determined Contribution (Mar. 3, 2016); see The White House, Fact Sheet: U.S. Reports its 2025 Emissions Target to the UNFCCC, (March 31, 2015), <https://obamawhitehouse.archives.gov/the-press-office/2015/03/31/fact-sheet-us-reports-its-2025-emissions-target-unfccc>.

23. THE UNITED STATES OF AMERICA NATIONALLY DETERMINED CONTRIBUTION, *supra* note 20, at 2-3.  
 24. *Id.* at 3.  
 25. 2030 Agenda, *supra* note 1, at 19.

lined a number of strategies that advocates have long called for to work within existing executive agencies' authority to advance clean energy.<sup>26</sup> Additionally, on December 8, 2021, President Biden signed Executive Order No. 14057, which calls for the reduction of emissions across federal operations, investment in American clean energy industries and manufacturing, and creation of clean, healthy, and resilient communities.<sup>27</sup> President Biden has asserted that the bipartisan Infrastructure Investment and Jobs Act of 2021,<sup>28</sup> his proposed budget, and the proposed Build Back Better Act<sup>29</sup> will provide agencies with the funding necessary to achieve the goals of the Executive Order;<sup>30</sup> the proposed funding, if fully implemented, should go a long way toward achieving goals. In addition, new leadership at the U.S. Environmental Protection Agency (EPA) creates opportunities. The federal RE-Powering America's Land program, for example, can expand its work in facilitating renewable energy projects siting on suitable contaminated lands.<sup>31</sup> With an understanding of the progress that has been made, we can consider recommendations to improve clean energy development moving forward.

To achieve Goal 7 and the targets for emissions reduction outlined in the NDC, the Biden Administration needs support from Congress for new measures to accelerate clean energy development. As this volume headed to press, Congress lent some of this vital support by enacting the Inflation Reduction Act (IRA) in 2022, as well as the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law (BIL) in late 2021, both of which include measures designed to accelerate clean

energy development.<sup>32</sup> While the details of this significant legislation are beyond the scope of this Article, key measures related to large-scale clean energy development are tax credits to spur development of clean technologies (e.g., IRA §§13101, 13103, 13502; BIL §§40331-34, 40341), funding, and other measures to stimulate offshore wind development (e.g., IRA §§50153, 50251). These Acts of Congress have the potential to make a significant contribution toward Goal 7 in the United States.

To advance clean energy further, Congress should enact the Biden Administration's proposed Energy Efficiency and Clean Electricity Standard (EECES). The EECES is aimed "at cutting electricity bills and electricity pollution, increasing competition in the market, incentivizing more efficient use of existing infrastructure, and continuing to leverage the carbon pollution-free energy provided by existing sources like nuclear and hydropower."<sup>33</sup> With support in Congress, such a measure could build on existing state mandates that have been effective in driving renewable energy projects to more fully engage all states in the energy transition. This would help to correct the ambition imbalance that currently exists across the states, which range from having no clean energy target at all to the bold 100% clean energy targets in place in a growing number of states.

Those states with ambitious clean energy targets are laying the groundwork for change that other states can follow or accept by federal mandate, if one is adopted. As of this writing, 13 states have adopted 100% clean energy or net-zero carbon goals.<sup>34</sup> These and other ambitious states are innovating and reforming long-standing regulatory structures through legislative and utility commission proceedings, reevaluating approaches to electricity ratemaking, implementing energy efficiency standards for new buildings, adopting measures to support energy storage as a complement to projected growth in renewable energy, and revising siting approval processes for utility-scale renewable energy siting to minimize delay and ensure tangible benefits accrue to host communities.<sup>35</sup> It is clear that no one single policy will accomplish a transition to clean energy. Whether at the federal or state level, a range of complementary and mutually reinforcing strategies will be required. To assist states and state-level advocates in pursuing effective clean energy policies, model laws for advancing clean energy policy at the state level are available to assist rapid adoption of such laws across the states.<sup>36</sup>

26. Executive Order No. 14008, Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 7619 (Feb. 1, 2021). Strategies include:

- Charging a task force of agency leaders to develop a comprehensive federal clean electricity and vehicle procurement strategy to facilitate the carbon-free electricity goal through federal purchasing leverage and to shift federal, state, tribal, and local vehicle fleets to zero-emission vehicles (§205).
- Accelerating the pace of renewable energy development on federal public lands and in offshore federal waters (§207). The Order specifically directs the Secretary of the Interior to "engage with Tribal authorities regarding the development and management of renewable and conventional energy resources on Tribal lands." Key aspects for the agency to focus on include methods for increasing access to capital for renewable energy development, ensuring maximum tribal control over energy development on tribal lands, and continuing to improve communication and support structures for tribes within the Department of the Interior.
- Reviewing "siting and permitting processes" to identify ways to "accelerate the deployment of clean energy and transmission projects" and "ensure that Federal infrastructure investment reduces climate change" (§213).

27. 86 Fed. Reg. 70935 (Dec. 13, 2021).

28. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429, H.R. 3684 (2021), <https://www.congress.gov/117/bills/hr/3684/BILLS-117hr3684enr.pdf>.

29. H.R. 5376, 117th Cong. (2021).

30. Fact Sheet, The White House, President Biden Signs Executive Order Catalyzing America's Clean Energy Economy Through Federal Sustainability (Dec. 8, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/08/fact-sheet-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/>.

31. EPA, *RE-Powering America's Land*, <https://www.epa.gov/re-powering> (last updated May 26, 2022). "RE-Powering America's Land is an EPA initiative that encourages renewable energy development on current and formerly contaminated lands, landfills, and mine sites when such development is aligned with the community's vision for the site." *Id.*

32. See Inflation Reduction Act of 2022, Pub. Law No. 117-169 (117th Cong. 2021-22) (Aug. 7, 2022); Infrastructure Investment and Jobs Act, Pub. Law 117-58 (117th Cong. 2021-22) (Nov. 15, 2021).

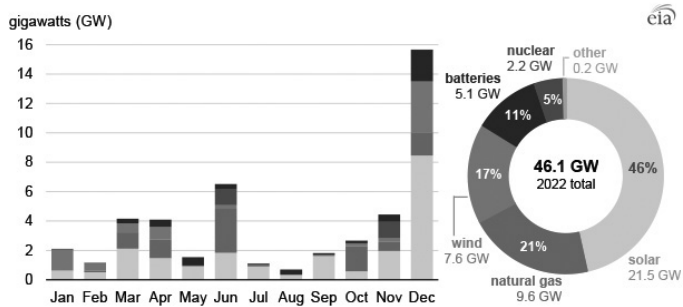
33. See Fact Sheet, The White House, The American Jobs Plan (Mar. 31, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/>.

34. See NC CLEAN ENERGY TECHNOLOGY CENTER & DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY (DSIRE), RENEWABLE & CLEAN ENERGY STANDARDS (2020), <https://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2020/09/RPS-CES-Sept2020.pdf>.

35. For more on the topic of siting, see Uma Outka, *Renewable Energy Siting in the Critical Decade*, 69 KAN. L. REV. 101 (2021).

36. See, e.g., LPDD—Model Laws for Deep Decarbonization in the United States, <https://lpdd.org/> (last visited June 21, 2022); American Council for

**Figure 3. Planned U.S. Utility-Scale Electric Generating Capacity Additions (2022)**



Source: Solar Power Will Account for Nearly Half of New U.S. Electric Generating Capacity in 2022, U.S. ENERGY INFO. ADMIN., Jan. 10, 2022, <https://www.eia.gov/todayinenergy/detail.php?id=50818> (last visited Sept. 9, 2022).

Like Congress, states should also adopt measures to promote clean energy development in order to both standardize the work across states and match/coordinate with congressional efforts. Indeed, the importance of state and local governments to weather the potential of the IRA and BIL should not be underestimated, as they play such an essential role in the siting of energy infrastructure. To help in such efforts, states should consider model laws for advancing clean energy policy. Additionally, states should coordinate with the Administration, other states, and tribes to ensure that a range of complementary and mutually reinforcing strategies are adopted.

Tribal nations are also working to advance the development of clean and renewable energy. For example, there are now more than 50 tribal climate change action plans adopted across the United States.<sup>37</sup> The Navajo Nation is developing its own methane-reduction regime (see Box 2). As the Center for American Progress has noted, this kind of program complements other tribal environmental initiatives, as “tribal nations are implementing lands and resource management practices, such as relocating invasive plants and animals, redirecting agricultural runoff, contributing to reforestation efforts, and identifying harmful algae blooms.”<sup>38</sup> Furthermore, numerous tribes are engaged in renewable and clean energy development across the United States.<sup>39</sup> Access to capital to develop such projects remains a serious barrier for many tribes despite immense renewable resource potential on tribal lands. According to the U.S. Department of Energy, wind and solar energy represents economic potential of “more than \$75 billion in

## Box 2. Methane Reduction

The Navajo Nation experiences disproportionate levels of methane emissions due to oil and gas companies venting methane (or failing to prevent leaks). The Nation is working to promulgate its own methane rules to supplement federal standards. Not only would methane reduction result in environmental benefits, but it would bring additional revenue to the Nation.

Source: Amber Reimondo, *Reducing Methane Emissions on the Navajo Nation*, GRAND CANYON TR., Mar. 21, 2019, <https://www.grandcanyontrust.org/blog/reducing-methane-emissions-navajo-nation>.

project investment.<sup>40</sup> With dedicated federal and private-sector support and collaboration, tribes can play a significant role in the clean energy transition. See Figures 4 and 5 for information on wind and photovoltaic capacity in Indian country.

Given the important work being done by tribes in this space, there are several steps that tribes should take. First, tribes should work with federal, state, and private partners to help them understand the work being done at the tribal level. Second, tribes should, either on their own or through collaboration with partners, work to develop the clean energy resources within their borders. The federal government and states should also partner with tribes to ensure that the necessary infrastructure is developed to transport clean energy developed within Indian country to larger population locations. Currently, such infrastructure development is lacking.

Similarly, local governments can use their authority to advance clean energy, as an increasing number of cities are doing through power purchase agreements connected to renewable energy projects. According to the Rocky Mountain Institute, nearly 200 cities have committed to procure 100% clean energy.<sup>42</sup> Through municipal ordinances, local governments can also support distributed renewables and building efficiency, beneficial electrification (replacing direct fossil fuel use (e.g., natural gas with electricity)), and electric vehicle infrastructure. Model laws and ordinances for the local level are available for cities that are only now organizing around these goals.<sup>43</sup>

Accordingly, where applicable, local governments should use power purchase agreements to connect with renew-

an Energy-Efficient Economy (ACEEE), *State and Local Policy Database*, <https://database.aceee.org> (last visited June 21, 2022). See also State Policy Opportunity Tracker, <https://spotforcleanenergy.org> (last visited June 21, 2022) (detailing policy gaps and areas for reform opportunity by state); SAM RICKETTS ET AL., STATES ARE LAYING A ROAD MAP FOR CLIMATE LEADERSHIP (2020), <https://americanprogress.org/wp-content/uploads/2020/04/StatesClimate-brief.pdf>.

37. Northern Arizona University, *Welcome to the ITEP Tribes and Climate Change Program*, <http://www7.nau.edu/itep/main/tcc> (last visited June 21, 2022).

38. See, e.g., RICKETTS ET AL., *supra* note 36.

39. See Elizabeth Ann Kronk Warner, *Renewable Energy Depends on Tribal Sovereignty*, 69 KAN. L. REV. 809 (2021).

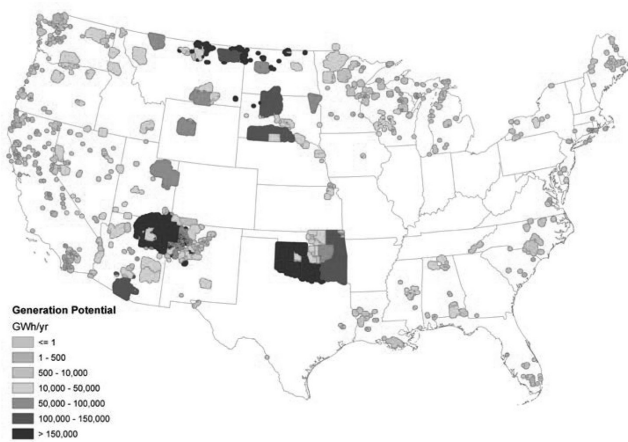
40. ANELIA MILBRANDT ET AL., NATIONAL RENEWABLE ENERGY LABORATORY, TECHNO-ECONOMIC RENEWABLE ENERGY POTENTIAL ON TRIBAL LANDS 39 (2018) (NREL/TP-6A20-70807).

41. ANELIA MILBRANDT ET AL., NATIONAL RENEWABLE ENERGY LABORATORY, TECHNO-ECONOMIC RENEWABLE ENERGY POTENTIAL ON TRIBAL LANDS 10 (2018) (NREL/TP-6A20-70807).

42. See STEPHEN ABBOTT & RYAN SHEA, ROCKY MOUNTAIN INSTITUTE, A LOCAL GOVERNMENT GUIDE TO OFF-SITE RENEWABLE PPA RISK MITIGATION 6 (2021), [https://rmi.org/wp-content/uploads/dlm\\_uploads/2021/03/rmi\\_off\\_site\\_ppa\\_risk\\_mitigation.pdf](https://rmi.org/wp-content/uploads/dlm_uploads/2021/03/rmi_off_site_ppa_risk_mitigation.pdf).

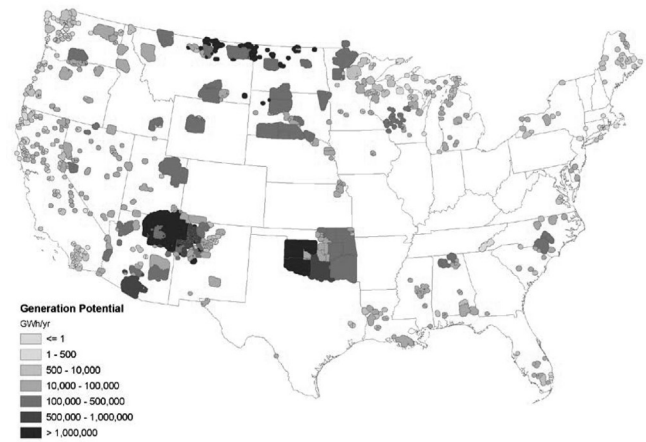
43. See, e.g., LPDD—Model Laws for Deep Decarbonization in the United States, *supra* note 36; Sabin Center for Climate Change Law, *Model Municipal Ordinances*, <https://climate.law.columbia.edu/content/model-municipal-ordinances> (last visited June 21, 2022) (addressing renewable energy and energy-efficient buildings); ACEEE, *supra* note 36.

**Figure 4. Wind Generation Potential by Reservation (including extended areas of 10 miles adjacent to the tribal land boundaries)**



Source: ANELIA MILBRANDT ET AL., NATIONAL RENEWABLE ENERGY LABORATORY, TECHNO-ECONOMIC RENEWABLE ENERGY POTENTIAL ON TRIBAL LANDS 6 (2018) (NREL/TP-6A20-70807).

**Figure 5. Photovoltaic Generation Potential by Reservation (including extended areas of 10 miles adjacent to the tribal land boundaries)**



Source: ANELIA MILBRANDT ET AL., NATIONAL RENEWABLE ENERGY LABORATORY, TECHNO-ECONOMIC RENEWABLE ENERGY POTENTIAL ON TRIBAL LANDS 10 (2018) (NREL/TP-6A20-70807).

able energy projects. Local governments should also use municipal ordinances to promote renewable energy and building efficiency, beneficial electrification, and electric vehicle infrastructure. Whenever possible, local governments should coordinate with the Administration, states, and tribes to ensure that a range of complementary and mutually reinforcing strategies are adopted.

The private sector has also been playing a significant role in driving renewable energy development. In terms of the private sector, we refer to the energy industry and also companies in general that are consumers of different energy resources. At a broad level, much as state, tribal, and local governments have done, corporate consumers of electricity, including many multinational companies, are setting zero-carbon or 100% renewable energy goals for their operations.<sup>44</sup> Further, within the energy sector, a growing number of electric utilities are increasingly setting internal clean energy targets as well, although on scrutiny, some utility plans have been criticized as greenwashing.<sup>45</sup> Private-sector plans for reducing and shifting energy consumption away from fossil fuels—so long as they have integrity of purpose and can be verified—will be an important complement to governmental clean energy measures.

Corporate and industrial consumers of electricity should set zero-carbon or 100% renewable energy goals for their

operations. This recommendation will help drive needed development of clean energy resources to meet demand. In addition, these large consumers should develop their own internal energy efficiency goals, even where energy efficiency standards do not require them to do so, to reduce overall energy consumption.

#### IV. Ensuring Energy Access and Affordable Energy in the United States

Target 7.1 calls for an expansion of affordable energy.<sup>46</sup> Although energy access is universally available in the United States, high energy burden in low-income households threatens consistent energy access for millions of Americans. This aspect of Goal 7 intersects particularly with Goal 1 (No Poverty), Goal 3 (Good Health and Well-being), and Goal 10 (Reduced Inequalities). The COVID-19 pandemic highlighted the seriousness of this issue, as many people were unable to pay their utility bills due to job losses, and the need for further progress on this aspect of Goal 7 came clearly into focus within energy policy. Goal 7 has implications for energy justice and intersects with longstanding programs in the United States aimed at affordable energy. These programs must be expanded—both in terms of access and in terms of covered services—if the United States is to make significant progress toward Target 7.1.

“Energy burden” refers to how much household income is devoted to the cost of electricity and heating. Recent research by the American Council for an Energy-Efficient Economy shows that 25% of U.S. households (30.6 million) are considered to have a high energy burden, and

44. See, e.g., RE100, <https://www.there100.org/> (last visited June 21, 2022).

45. See JOHN ROMANKIEWICZ ET AL., SIERRA CLUB, THE DIRTY TRUTH ABOUT UTILITY CLIMATE PLEDGES (2021), [https://www.sierraclub.org/sites/www.sierraclub.org/files/blog/Final%20Greenwashing%20Report%20%281.22.2021%29.pdf?\\_ga=2.163547839.288002361.1611578929-2075657276.1610633741](https://www.sierraclub.org/sites/www.sierraclub.org/files/blog/Final%20Greenwashing%20Report%20%281.22.2021%29.pdf?_ga=2.163547839.288002361.1611578929-2075657276.1610633741); cf. Lori Bird & Tyler Clevenger, *2019 Was a Watershed Year for Clean Energy Commitments From U.S. States and Utilities*, WORLD RES. INST., Dec. 20, 2019, <https://www.wri.org/blog/2019/12/2019-was-watershed-year-clean-energy-commitments-us-states-and-utilities> (includes summary of utility clean energy commitments).

46. 2030 Agenda, *supra* note 1.

significant disparities exist in the degree of energy burden experienced in Black, Hispanic, and Native American households compared with white households.<sup>47</sup> The affordability component of Goal 7 is thus a significant energy justice issue.<sup>48</sup>

For 40 years, the federal Low-Income Home Energy Assistance Program (LIHEAP) has been the primary source of governmental support for low-income households struggling with energy bills. The structure of LIHEAP spans the federal, state, tribal, and local levels. Each year, Congress appropriates funding for LIHEAP, which the U.S. Department of Health and Human Services distributes by formula to state, tribal, or local grantees. Grantees have discretion in how they in turn distribute the funds to eligible households, as determined with reference to federal poverty guidelines or state income levels.<sup>49</sup> According to the National Energy & Utility Affordability Coalition (NEUAC), most LIHEAP recipients have very low incomes, well below maximum eligibility thresholds; a typical LIHEAP recipient household has a median income of under \$20,000 for a family of three.<sup>50</sup> Most LIHEAP funding is spent on home heating, followed by crisis assistance (e.g., for a household facing imminent utility disconnection), low-cost weatherization, and cooling.<sup>51</sup>

Maintaining and increasing federal funding for LIHEAP is critical. LIHEAP is a lifeline—literally, in instances of extreme heat, extreme cold, and for those who need life-preserving medical equipment that requires electricity. However, it is well known that LIHEAP has never met the need for utility bill support for all eligible households. NEUAC reports less than 17% of the more than 33 million eligible households received LIHEAP support in 2020.<sup>52</sup>

State, tribal, and local actors should continue to improve outreach to eligible households to connect them with needed LIHEAP assistance. In addition, in the specific context of the COVID-19 pandemic and its aftermath, all levels of government should assist low-income households with utility debt relief. At the height of the pandemic, many states adopted utility disconnection moratoria, as did some utilities on a voluntary basis.<sup>53</sup> However, during the respite from bills, utility debt has mounted dramatically, and as moratoria expire, households will again be faced with the threat of disconnection if they do not have support in pay-

ing down the past-due bills. To address this problem, state, tribal, and local governments, working together with utilities, should develop measures for debt forgiveness and debt repayment to prevent household energy insecurity. This support is essential to preserving home energy access.

Funding for home weatherization for energy conservation and energy efficiency is needed as it lowers energy bills. Although funds for weatherization are provided to a limited extent under LIHEAP, a complementary federal program, the U.S. Department of Energy Weatherization Assistance Program (WAP), is also administered at the state, tribal, and local levels to assist lower income households with structural, mechanical, and other energy-saving improvements to their homes.<sup>54</sup> Yet only an exceedingly small fraction of those eligible receive help with weatherization.<sup>55</sup> As with LIHEAP, Congress must maintain and increase federal funding for WAP and thankfully has done so at a high level for the near future in the BIL (§40551). This continued support is essential to the affordability component of Goal 7. In addition, state, tribal, and local levels of government should improve community outreach to accomplish more weatherization, thereby reducing energy burden for eligible households.

In ways complementary to these longstanding federal programs, the IRA includes energy efficiency measures designed to make it easier for individual households to reduce energy burden as well as to improve energy efficiency in affordable housing (e.g., §§13301, 30002, 50121-22). How effective these provisions will prove to be depends on numerous factors, including outreach, education, and addressing financial barriers that, though reduced by the IRA, may still prevent low-income households from taking advantage of the benefits the law provides.

## V. Energy Burden in the Clean Energy Transition: Assuring Affordable and Clean Energy for All

Increasing clean energy and assuring energy access affordability are complementary goals, but there is no reason to assume they will fully align without purposeful policy intervention. A key insight of the sustainable development paradigm is that “economic, social, and environmental” progress cannot occur on separate tracks and be sustainable—all three must be fully integrated.

Consistent with this view, clean, affordable energy must be available for all during the clean energy transition to truly meet Goal 7. This will depend on law and policy to ensure disadvantaged communities are not overly burdened by energy development and that such communities

47. ACEEE, *HOW HIGH ARE HOUSEHOLD ENERGY BURDENS?* 10-12 (2020).

48. For a helpful primer on energy justice, see CARMEN GONZALEZ ET AL., *ENERGY JUSTICE: US AND INTERNATIONAL PERSPECTIVES* (2018).

49. MELINDA GISH, CONGRESSIONAL RESEARCH SERVICE, *REPORT FOR CONGRESS: THE LOW-INCOME HOME ENERGY ASSISTANCE PROGRAM (LIHEAP)* 2 (2001).

50. NEUAC, *MAXIMIZE LIHEAP FUNDING IN 2022: UNITED STATES BY THE NUMBERS* (2021), <https://neuac.org/wp-content/uploads/2021/04/US-state-sheet-2022.pdf>.

51. LIBBY PERL, CONGRESSIONAL RESEARCH SERVICE, *LIHEAP: PROGRAM AND FUNDING* 2-3 (2018).

52. NEUAC, *supra* note 51.

53. See RICHARD J. CAMPBELL & ASHLEY J. LAWSON, CONGRESSIONAL RESEARCH SERVICE, *COVID-19 ELECTRIC UTILITY DISCONNECTIONS* (2020).

54. See U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, *Weatherization Assistance Program*, <https://www.energy.gov/eere/wap/weatherization-assistance-program> (last visited June 21, 2022).

55. See RESOURCES FOR THE FUTURE, *POLICY OPTIONS TO ENABLE AN EQUITABLE ENERGY TRANSITION* 7 (2021).

also benefit from such development. Executive Order No. 14008 specifically addressed this goal with the Justice40 Initiative (§223), which calls on appropriate federal officials to “publish recommendations on how certain Federal investments might be made toward a goal that 40 percent of the overall benefits flow to disadvantaged communities.”<sup>56</sup> The areas for investment most pertinent to Goal 7 include “clean energy and energy efficiency, clean transit, [and] affordable and sustainable housing.” To help ensure that these benefits truly help communities as intended, the Executive Order also requires federal agencies to consult with communities.<sup>57</sup> An “annual Environmental Justice Scorecard detailing agency environmental justice performance measures” is to be made available on an online platform.<sup>58</sup> With §223, the Executive Order calls for recommendations based on “existing authorities the agencies may possess for achieving the 40-percent goal as well as recommendations on any legislation needed to achieve the 40-percent goal.”<sup>59</sup> This directive will help to ensure that the new funding available via the IRA in particular reach communities that need them most.

State, tribal, and local governments are also leading in this area by doing more than merely advancing clean energy; they are also specifically addressing how benefits will flow to disadvantaged communities. In January 2021, New York announced a goal to “direct 40 percent of the benefits from clean energy investments to disadvantaged communities.”<sup>60</sup> Both California through the CalEnviroScreen program and Washington through the Health Disparities Map project are tracking how disadvantaged communities are impacted by pollution and potential health disparities.<sup>61</sup> New Jersey and North Carolina have adopted similar mapping tools.<sup>62</sup> Though not all energy related, these data can assist in prioritizing clean energy investment where it has the potential to remedy economic disadvantage or minimize pollution exposure. Along those lines, the California Air Resources Board is required to directly address air quality concerns in communities most

impacted by toxic and criteria air pollutants.<sup>63</sup> The Virginia Clean Economy Act “directs half of the state’s RGGI [Regional Greenhouse Gas Initiative] auction proceeds to energy efficiency upgrades for low-income Virginians and 45 percent to flood mitigation and coastal resilience with a set-aside for disadvantaged communities.”<sup>64</sup> These developments are steps in the right direction and other states should follow suit, adapting state law and policy to directly integrate clean energy progress and environmental justice protections. Unfortunately, to date, the majority of states have not adopted stringent clean energy requirements and even fewer are actively tracking what benefits and burdens of existing energy systems flow to disadvantaged communities. In the near term, these states should adopt measures to promote clean energy (renewable energy and energy efficiency) in ways that channel the economic and environmental benefits of the clean energy transition to low-income communities, especially those that have hosted polluting energy industries.

Likewise, tribes are making progress switching to and investing in clean energy. For example, the Standing Rock Sioux Tribe built a solar farm that produces enough energy to power two large community buildings. The Winnebago Tribe installed solar panels on every building it could within its reservation and developed 720 kilowatts of solar capacity.<sup>65</sup> Some local governments are pursuing innovative ways to pursue equity through clean energy policy.<sup>66</sup> Municipalities with their own utilities are able to leverage that control to develop community solar projects that promote equitable clean energy access.<sup>67</sup>

Over the next decade, integrated reforms that connect the benefits of the clean energy transition to low-income households with high energy burden present perhaps the most important opportunity for advancing Goal 7 in the United States. As states with climate ambition reform electric utility ratemaking, states should ensure that utility ratepayers—and in particular low-income ratepayers—are well represented by advocates for their interest. Many states have a ratepayer board or consumer advocate’s office that represents the interests of residential utility customers in rate proceedings, but they are far under-resourced compared with the legal teams that represent utilities before utility commissions. States with such offices should increase their funding and staff training, so that they can represent

56. 86 Fed. Reg. 7619, 7632 (Jan. 27, 2021).

57. *Id.*

58. *Id.*; Fact Sheet, The White House, A Year Advancing Environmental Justice (Jan. 26, 2022), <https://www.whitehouse.gov/briefing-room/statements-releases/2022/01/26/fact-sheet-a-year-advancing-environmental-justice/>.

59. 86 Fed. Reg. 7619, 7632 (Jan. 27, 2021)

60. Governor Cuomo Announces More Than \$17 Million to Help Communities Drive High-Impact Clean Energy Actions and Combat Climate Change (Jan. 26, 2021), <https://www.solarpowerworldonline.com/2021/01/gov-cuomo-announces-over-17-million-for-new-york-community-clean-energy-efforts/>.

61. TIFFANY ENG ET AL., CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE, CALENVIROSCREEN: A CRITICAL TOOL FOR ACHIEVING ENVIRONMENTAL JUSTICE IN CALIFORNIA (2018), [https://caleja.org/wp-content/uploads/2018/08/CEJA-CES-Report-2018\\_web.pdf](https://caleja.org/wp-content/uploads/2018/08/CEJA-CES-Report-2018_web.pdf); Washington State Department of Health, *Washington Environmental Health Disparities Map*, <https://doh.wa.gov/data-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map> (last visit June 21, 2022).

62. New Jersey Environmental Justice Mapping Tool, <https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=34e507ead25b4aa5a5051dbb85e55055> (last visited June 21, 2022); North Carolina Department of Environmental Quality, *DEQ North Carolina Community Mapping System*, <https://deq.nc.gov/outreach-education/environmental-justice/deq-north-carolina-community-mapping-system> (last visited June 21, 2022).

63. California Air Resources Board, *Community Air Protection Program*, <https://ww2.arb.ca.gov/our-work/programs/community-air-protection-program> (last visited June 21, 2022).

64. RICKETTS ET AL., *supra* note 36.

65. 3 *Native American Tribes Leading the Way on Clean Energy*, CLIMATE REALITY PROJECT, Aug. 8, 2019, <https://www.climatealityproject.org/blog/3-native-american-tribes-leading-way-clean-energy>. See generally Warner, *supra* note 39.

66. See, e.g., ACEEE, FOSTERING EQUITY IN LOCAL CLEAN ENERGY POLICY: LESSONS FROM THE 2019 CITY CLEAN ENERGY SCORECARD; Alexander Dane & Alisa Petersen, 6 *Innovative Ways to Fund Climate Action and Equity in US Cities*, WORLD RES. INST., May 6, 2021, <https://www.wri.org/insights/funding-models-climate-equity-cities-us>.

67. See, e.g., TIMOTHY DENHERDER-THOMAS & JONATHAN WELLE, INSTITUTE FOR LOCAL SELF-RELIANCE, EQUITABLE COMMUNITY SOLAR: POLICY AND PROGRAM GUIDANCE FOR COMMUNITY SOLAR PROGRAMS THAT PROMOTE RACIAL AND ECONOMIC EQUITY (2020).



low-income ratepayers effectively in a rapidly changing and complex regulatory environment. States without such an office should establish one or, at minimum, establish an intervenor fund so that nonprofit advocates for low-income ratepayers can advance their interests in utility commission rate proceedings and other regulatory reform dockets.

## **VI. Conclusion**

All governmental levels—federal, state, tribal, and local—have played a role and must continue to play a role in working to meet the targets established by Goal 7. Additionally, as highlighted above, the private sector also has a role to play by demanding and therefore hopefully increasing the production of clean and renewable energy. Energy regulation is in a dynamic state of change, shifting toward clean energy resources. It is critical to achieving Goal 7 that affordable energy access and reducing energy burden on low-income households be an integral consideration in clean energy regulatory reform at the federal, state, tribal, and local levels. At the federal level, Congress has made sub-

stantial funding commitments consistent with Goal 7 that have the potential to drive clean energy development—if state and local governments do not hinder that progress—and expand affordable energy access to those in need. For tribes, the largest barrier to developing clean energy resources and distributing them in an equitable manner remains investment. Tribes must continue to work toward the development of their clean and renewable resources in a sustainable way, and the federal and state governments must partner with tribes to assist with adequate financing and infrastructure development. And, finally, local governments also have an important role to play as partners with the federal, state, and tribal governments and as promoters of clean and renewable energy, such as through clean power purchase agreements.

As detailed at the start of this Article, progress has been made on Goal 7, but much work remains. Without intensive, purposeful, and coordinated governmental and private-sector efforts as detailed above, it is unlikely that the targets established in Goal 7 will be accomplished by 2030.