

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

**Geneva, Switzerland
25-26 October 2022**

Contribution by USA

to the CSTD 2022-2023 priority theme on “Technology and innovation for cleaner
and more productive and competitive production”

DISCLAIMER: The views presented here are the contributors' and do not necessarily reflect the views and position of the United Nations or the United Nations Conference on Trade and Development

PRIORITY THEME 1: Technology and innovation for cleaner and more productive and competitive production

United Nations Commission on Science and Technology for Development (CSTD)

Dear CSTD member,

As you are aware, the [CSTD 25th annual session](#) selected “Technology and innovation for cleaner and more productive and competitive production” as one of the priority themes for its 26th session (2022-23 period). This priority theme is directly relevant to SDG 9 on industry, innovation and infrastructure.

As highlighted by the [Technology and Innovation Report 2021](#), We live in a time of rapid technological change, at the height of the digital transformation and the early stages of the Industry 4.0 revolution. These technological waves have great potential to bring about the transformations needed to achieve the SDGs, reduce poverty, tackle climate change and put the world on a sustainable path. They also offer a window of opportunity for developing countries to catch up technologically and narrow global divides. Critical areas for innovation in this new technological revolution are renewable energy technologies and frontier technologies for sustainable production and consumption. Innovation in these areas could help diversify economies and create higher-wage jobs while protecting the planet.

This priority theme will examine national strategies and policies related to green technology and green innovation, and the role of international cooperation, including triangular and South-South cooperation, in supporting developing countries to benefit from windows of opportunity for developing, using, adopting and adapting these frontier technologies in production processes for catching up economically and technologically.

Questions to be addressed include: What countries should do to take advantage of this window of opportunity? How could the international community support developing countries in this regard?

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting from 25 to 27 October 2022. In this context, we would like to solicit input from the CSTD members on this theme. We would be grateful if you could kindly answer the following questions based on your experience in your country or region.

1. What are some specific examples (from the public and private sectors) of green technology and innovation for cleaner and more productive and competitive production in your country? Please include contact, website, link to reports and any other relevant information concerning these projects and initiatives.

A current, relevant example is Puerto Rico’s Community Development Block Grant – Mitigation Program (CDBG-MIT). This program is primarily focused on the reparation the energy grid is good. The program involves a \$500 million grant managed by PR’s Department of Housing and Urban Development. At the single-family home level, this program will install photovoltaic systems, solar generators, and battery storage at capacities aligned with household needs, including the consideration of critical medical needs. At the community level, it will include installations of energy production and storage, water catchment systems, and sanitary sewer system solutions to reduce household barriers to mitigation: [Home - CDBG \(pr.gov\)](#); please contact: Maretzie Dias Sanchez at mdiaz@vivenda.pr.gov

At the state and local level, another example is the Virginia Department of Housing and Community Development’s National Disaster Resilience Competition grant to build a resilience hub and mobile manufacturing units using technology to monitor flood risk: [RISE | DHCD \(virginia.gov\)](#); please contact Traci Munyan at traci.munyan@dhcd.virginia.gov

2. What are the national strategies, policies, and laws concerning green technology and innovation for cleaner and more productive and competitive production in your country?

The most prevalent strategy in the United States is goal setting. The Biden administration set a goal of 50 percent reduction in US Greenhouse Gas emissions from 2005 levels in 2030. In early 2021, 24 states and the District of Columbia had set goals for reducing greenhouse gas emissions.

A big first step toward decarbonization in the US was the authoritative report by the US National Academy of Sciences, Engineering, and Medicine report Accelerating Decarbonization of the U.S. Energy System to assess the technological, policy, and social dimensions to accelerate the deep decarbonization of the U.S. economy and recommend research and policy actions in the near to midterm. An interim report was published in 2021 and focuses on the first 10 years of a 30-year effort—a comprehensive report covering the final two decades will follow in 2022. The full report will include a thorough discussion of local, state, and regional policies.

The U.S. Federal government promotes energy efficiency through a number of programs most notably Energy Star which is an energy efficiency product labelling program. Weatherization Assistance Program which enables low-income families to reduce their energy bills by making their homes more energy efficient. Other financial incentives include tax credits for on-site renewable energy and energy efficient upgrades and other financing programs.

In many ways cities and states have provided strong leadership in promoting and advancing the nation's climate goals. At the regional level, Metropolitan Planning Organizations (MPOs) or regional Councils of Governments (COGs) have also adopted regional plans for sustainable growth and development. National governments can provide (1) incentives for innovative financing in the form of principal write-downs, guarantees, or loan loss reserves; (2) technical assistance and/or information sharing; (3) research and evaluation of barriers to financing and best practices/models.

National governments can convene accelerators that focus on key topics to improve public and private partnerships, for example increasing access to whole building (aggregated) utility data needed to benchmark utility consumption in buildings. Finally, national governments can identify barriers in their own programs to state, regional or local actions in support of building retrofits; and also better integrate or braid their resources. For example, several agencies (Department of Energy, Health and Human Services, as well as HUD, are looking at ways to better align income eligibility guidelines for low-income weatherization).

National governments can also better support local/regional actions by developing analytic or modelling tools that can be used by the private sector as well as regional, state and local entities (e.g. USG has developed EnerPlus, PVWatts, Disco, REopt, Cambium, REScheck, etc.). National governments can also establish or maintain energy standards (e.g. Energy Star Certified Homes or Energy Star certified appliances, or Zero Energy Ready Homes), or incentivize the use of privately-supported green buildings standards (e.g. LEED, National Green Building Standard, Enterprise Green Communities, Passive House, Living Building Challenge). While the U.S. does not have a single national energy code, national governments can incentivize adoption of the most current published building codes.

3. What are the key industries that are pioneering green innovation in the country? List the key actors in the national ecosystem of innovation related to green innovation in your country (firms, universities, financial institutions, regulators)? What are the key networks of the ecosystem in your country (including online networks, innovation hubs, forums, etc.)?

The National Initiative to Advance Building Codes is a whole of government initiative to assure alignment of, and minimum standards for all building activity funded through federal agency programs, utilizing the consensus-based International Code Council set of codes as the basis (International Building Code, International Residential Code, and suite of "I-codes"). HUD's Office of Community Planning and Development (CPD) recently conducted an analysis of the code, and concluded that, among other observations:

- A. Some HUD programs (e.g. FHA Single Family mortgage insurance) rely on local code enforcement; setting building code above state and local codes would set a "two-tier" system that could require HUD to establish its own compliance and enforcement regimens. Builders would need to familiarize themselves with these new codes,

- B. The latest building codes may involve additional front-end costs; if financed with debt adoption of these codes could negatively impact housing affordability by increasing debt service or initial down payment amounts, and
- C. Unlike federal buildings, HUD programs finance privately owned housing or public housing that serve LMI households; whereas federal buildings can pay for any added costs with additional appropriations, this inventory will need to absorb any added cost through existing appropriations, and given HUD's affordability constraints, can't pass on such costs to the renter/homeowner.

To address these issues, CPD has taken some important steps. Among them is that Multifamily Housing has done quite a good job at promoting the adoption of innovative technologies in multifamily housing through webcasts and other informational events. The Office of Energy and the Environment, for example, is currently launching the Better Climate Challenge which requires a commitment to 50% carbon reduction. This commitment will involve adoption of building electrification, renewable energy and super efficient building envelope technologies – all of which will be documented and available for public consumption.

Better Building Challenge: [Better Buildings Challenge | Better Buildings Initiative \(energy.gov\)](#)

Better Climate Challenge: [Better Climate Challenge | Better Buildings Initiative \(energy.gov\)](#)

Resilient Building Codes Toolkit: [Resilient Building Codes Toolkit - HUD Exchange](#)

4. What are the challenges that your government have faced or may face in promoting green technology and innovation in your country to contribute to national development priorities and accelerate the progress towards the SDGs?

The United States does not have a nationalized building code. As a result, the US does not have widespread adoption of the latest energy building codes. About 30 States are using the 2009 International Energy Conservation Code or older version. Only 10 states have adopted the 2018 IECC. Additionally, 8 states don't have a state-wide energy code, with a range of energy efficiency requirements by individual localities within those states (cities or regions).

One challenge we face is that decarbonization can be difficult in existing buildings. Regulation of utility providers is also not nationalized in the US. State's regulation of utility providers is also uneven. Also, an aging grid infrastructure can negatively influence complete building decarbonization.

Nevertheless, challenges will vary depending on the building type: residential, commercial, institutional, public facilities.

HUD's experience is primarily in the residential sector, both single family and multifamily. Single family challenges are primarily in the financing and underwriting arena having to do with valuing/underwriting energy efficiency upgrades as part of the home purchase/mortgage refinancing transaction. Utility costs and energy use are not typically included in the underwriting formula for home mortgages.

Major challenges to building renovations in the multifamily sector include (1) access to financing; (2) split incentives that in some properties leave little to no economic incentive for efficiency (tenant/owner, HUD/owner in HUD-assisted properties); (3) difficulty collecting utility data from hundreds or thousands of individual tenant meters; (4) regulatory barriers to energy efficiency financing (e.g. Energy Savings Performance Contracts (ESPCs) and Property Assessed Clean Energy (PACE) financing) for owners of subsidized affordable housing; (5) challenges retaining skilled/trained operations and maintenance workers, management/leadership turnover; (6) lack of organizational capacity in affordable multifamily partner organizations that limits their ability to tackle all other challenges.

The primary challenge to fully incentivizing both public and private property owners to conduct energy efficiency renovations is the lack of funding for incentives such as rebates, tax incentives, or loans for qualified purchases. The recently published US National Academy of Sciences, Engineering, and Medicine report Accelerating Decarbonization of the U.S. Energy System advocated for the establishment of a Green Bank to "mobilize finance for low-carbon infrastructure and business in America". The report recommended that the new bank should lend, provide loan guarantees, make

equity investments, cooperate with community banks to increase the availability of finance at the local level, and leverage private finance consistent with a national strategy to compete internationally in low-carbon industries and transform the U.S. economy.

Finally, we find convincing decision makers that green and resilient building is necessary, and that it will save money in the long-run. We struggle with added resilience requirements being viewed as additional government red tape rather than being viewed as protecting citizens and future investment.

5. What should governments, the private sector, organized civil society, and other stakeholders do so that developing countries can benefit from these technologies?

Governments, along with the private and Non-governmental entities, organized civil society and other stakeholders can benefit from these technologies by: sharing testing results; market data; efforts to inform/educate the housing industry as well as the consumers on these technologies and their benefits to reducing carbon footprints; addressing labor and human capital. Invest in research and development and focus on diffusion of market transformation of these technologies. Reduce risk aversion.

6. What are some examples of international cooperation mechanisms, projects, programmes or strategies, including triangular and South-South cooperation, in green technology and innovation that your country is part of?

The United States has several ways to engage internally. Through various international programs offered through the U.S. Department of State, including the International Visitor Leadership Program and other global south engagement programs. Through these programs the U.S. is able to share information and conduct learning exchanges. Other examples of international cooperation are through formal delegation visits, partnerships with research institutions, international organization cooperation, and through individual country to country formal memorandums of understanding/cooperation. The United States has international outreach through domestic agency's international affairs offices. Each major agency/ministry within in the United States has an international affairs office that conducts outreach to their counterparts. This includes agency's like the Department of Housing and Urban Development, the Department of Energy, and the Environmental Protection Agency. The U.S. Department of State has a Special Presidential Envoy for Climate, Secretary John Kerry. He has a robust team that is engaged in green technology and innovation.

7. What actions can the international community, including the CSTD, take to help your country take advantage of green technology and innovation for cleaner and more productive and competitive production?

We would like examples or best practice models for how to transition from oil, gas, and coal jobs to clean energy jobs. The incorporation of sustainable materials and the use of renewables are important priorities. International efforts to reduce energy consumption in public (or social) housing and the housing sector, in general, is important. Finally, the testing of innovative, durable (sustainable) building materials to address the affordable housing supply chain crisis.

8. Could you suggest some contact persons of the nodal agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further input or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

[Crystal Bergemann is the Senior Advisor on Climate to Secretary Marcia L. Fudge.](#)

9. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme in your country or region?

Examples of Existing Reports and Research on HUD's HUDUser Website:

[Operation Breakthrough | HUD USER](#)

[Using Technological Innovations To Lower Housing Construction Costs | HUD USER](#)

[Leveraging Building Innovations for Housing Affordability | HUD USER](#)

[Industrializing the Residential Construction Site \(huduser.gov\)](https://www.huduser.gov)

[Overcoming Barriers | HUD USER](#)

[Overcoming Barriers: To Innovation in the Home Building Industry April 2005 \(huduser.gov\)](#)

[Fostering Housing Innovation to Improve Affordability and Resilience | HUD USER](#)

[The Diffusion of Innovation in the Residential Building Industry \(huduser.gov\)](#)

[Housing Recovery and CDBG-DR \(huduser.gov\)](#)

[HUD's New Climate Action Plan | HUD.gov / U.S. Department of Housing and Urban Development \(HUD\)](#)

Forthcoming Reports:

“Overcoming Barriers to Innovation”

“Innovation in Offsite construction” (with National Institute of Building Sciences)

“Cross-Laminated Timber” (with University of North Carolina Agriculture & Technology)

“Advanced Modular Systems in Multifamily Development” (with University of Florida, Gainesville)

“Battery-Installed Wall Technology” (with Tennessee State University)

“3D Printed Components for Walls and Windows” (with Home Innovation Research Laboratory)

“3D Printed Housing” (with Texas Agriculture and Manufacturing University)

“Removing the Barriers to Factory Built Housing”

“Exploratory Study of Factory Built Housing in the Housing Industry”

Please send your responses and any further inputs on the theme to the CSTD secretariat (stdev@unctad.org) by 31 July 2022. We look forward to receiving your valuable input.

Sincere Regards,

CSTD secretariat

Sustainable Development Goals (SDG) (From - <https://www.un.org/sustainabledevelopment/infrastructure-industrialization/>)

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

Targets:

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

9.A Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States 18

9.B Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

9.C Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020