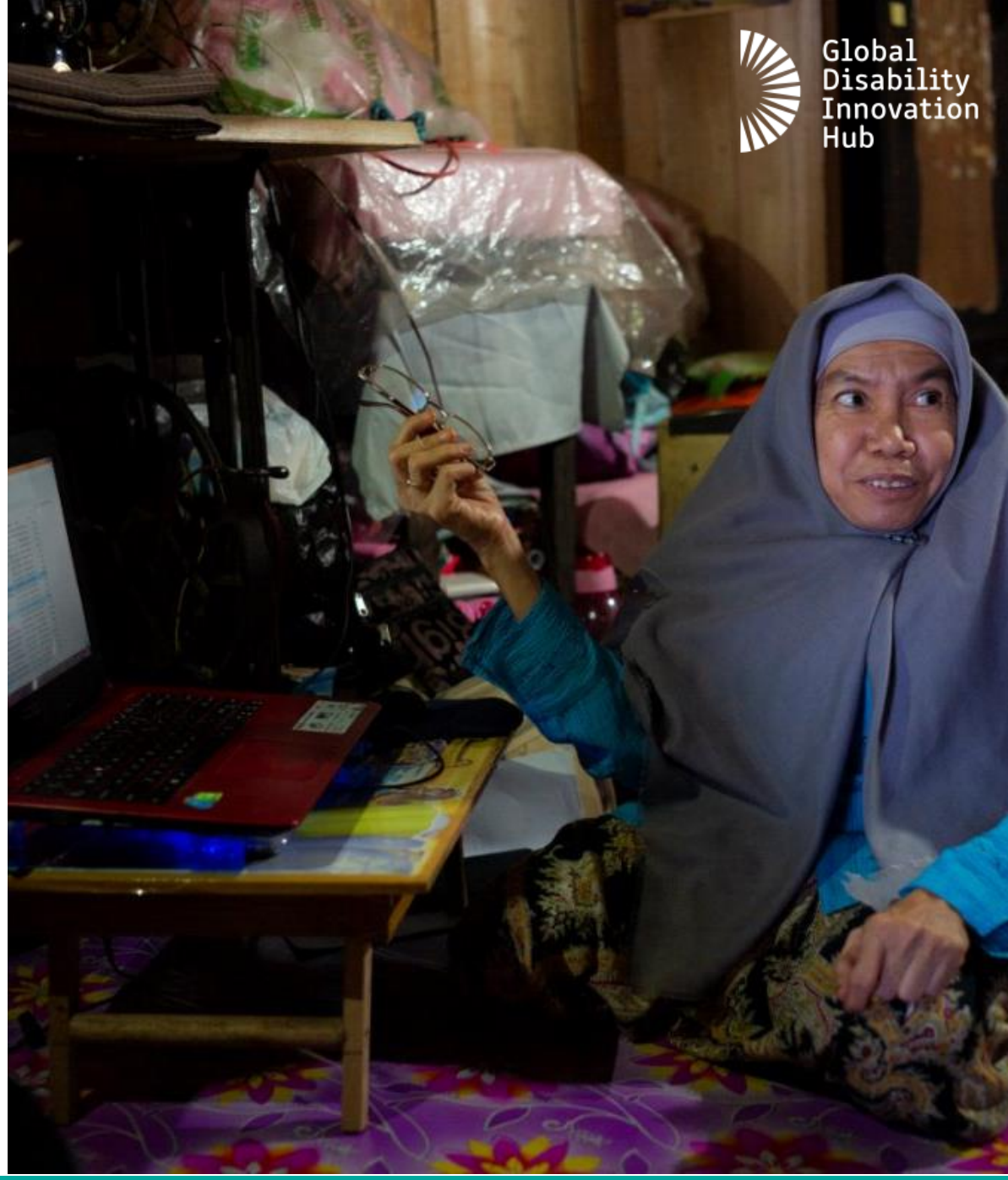
February 2025

Disability, Climate Change, and Energy Transition

DSS: **Online Training Course–Module 5**



UKaid
from the British people

Transforming
Energy
Access

Agenda

Global Disability Innovation Hub

1. **Introduction**
   GDI Hub, Team, Housekeeping
2. **Disability-inclusive climate action and energy access**
3. **Barriers, needs, and risks**
4. **Opportunities for disability-inclusive energy access**
5. **Summary and Next steps**
   Feedback, Triage Clinic

Acknowledgement

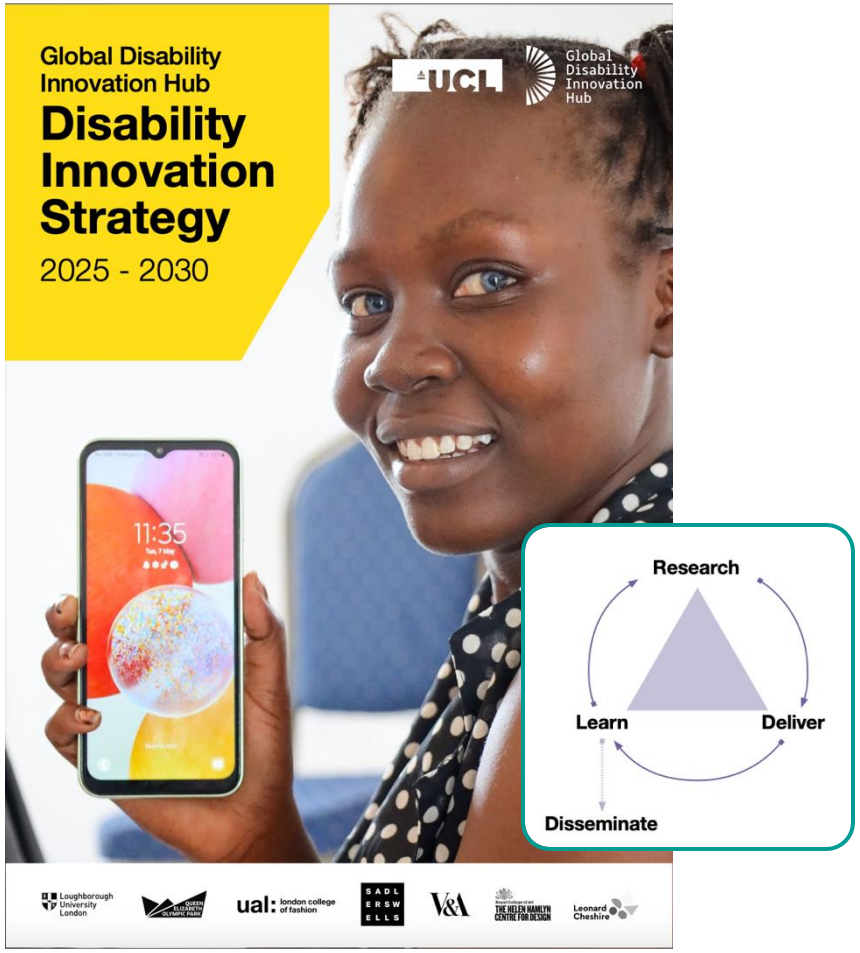
This material was funded with UK Aid from the UK government via the Transforming Energy Access platform.

1 Introduction

GDI Hub: Introduction

Global Disability Innovation Hub

Global Disability Innovation (GDI) Hub accelerates ideas into impact for a more just world—for disabled people, and all people.



41+ countries | 37 million people | 100+ partners

Growing new technologies & ecosystems I Supporting & scaling innovations I Strengthening systems I Pioneering research I Sharing knowledge I Building partnerships I Taking risks

Bringing together world leading academic research and practice-led delivery to address global challenges

Module 1 - 4 Recap: Key Messages

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Enablers of disability inclusion

- Disability confidence, engaging people with disabilities, accessibility, reasonable accommodations, disaggregated data.

Disability innovation

- **Developing affordable and sustainable adaptations or alternatives** for the 22 energy-based WHO-listed priority assistive products presents a high-impact opportunity.

Inclusive Design benefits everyone

- Delivering results 'with' and not 'for' people with disabilities

Inclusive communication enables equal participation

- Adopt **accessible formatting** tools/features as your default workflow
- Always **test your digital communication** material for 'accessibility'.

Suggested actions for TEA partners:

- Conduct disability inclusion **training and awareness workshop** for all staff.
- Explore **partnerships with disability innovators/ businesses.**
- Conduct **Accessibility Audits** for your business assets (physical, digital, and communication)

Training Module 5: Delivery Team

Global Disability Innovation Hub

Bala Nagendran M
Inclusive Climate Researcher
b.nagendran@ucl.ac.uk

(Thematic Lead & Presenter)

Pollyanna Wardrop
Senior Researcher, Financial Inclusion
pollyanna.wardrop.14@ucl.ac.uk

(Presenter & Moderator)

2 Disability-inclusive Climate Action and Energy Access

Three-fold impact of climate change

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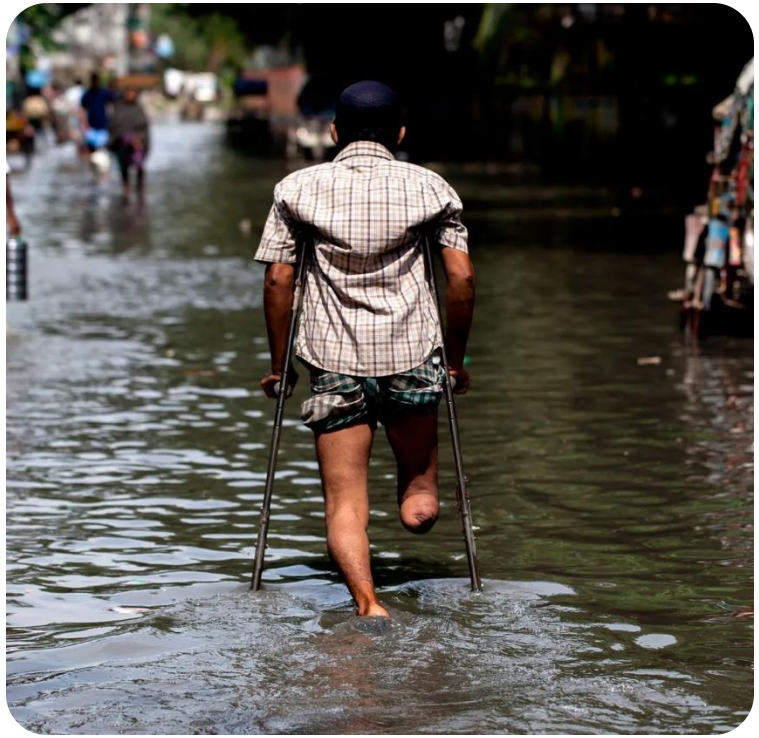
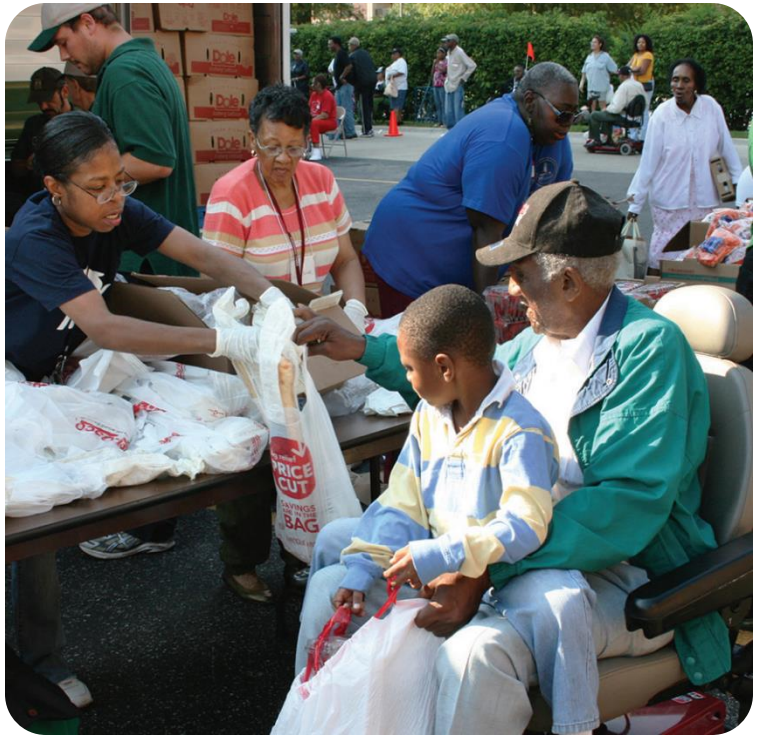
Disasters: Heat & cold waves, hurricanes, floods, drought, sea-level rise



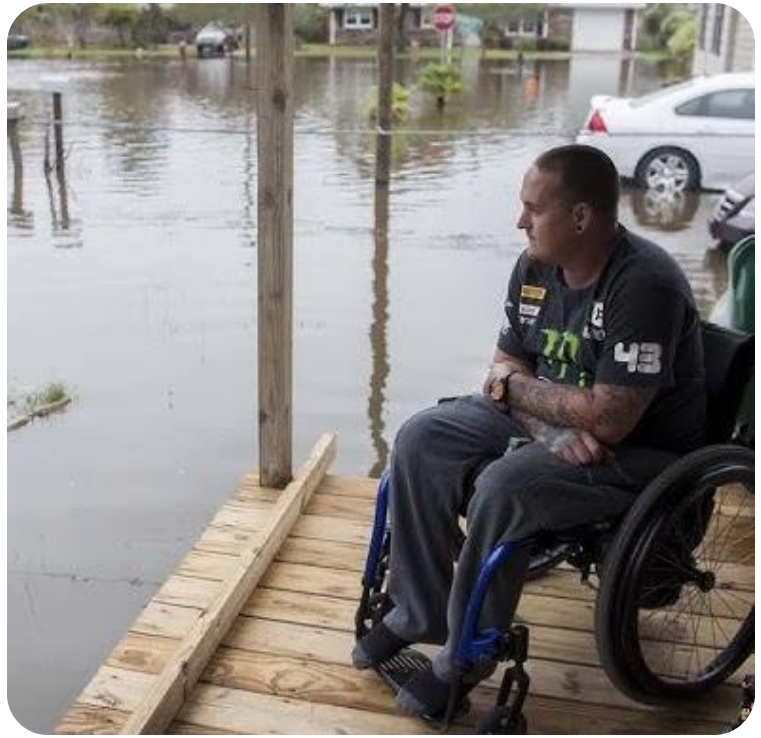
Source: TeenVogue, Getty images

Basic needs: Damage to shelter, social infrastructure, food insecurity, unequal energy access



Source: GCFD

Health crisis: Disrupted healthcare, losing access to medicines and assistive products



Source: PBS Newshour

Climate change is a disability issue

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In the context of climate change,

- People with disabilities are **4 times more likely to die in the event of a disaster** (Source: World Bank, 2023)
- **75% of people with disabilities feel excluded from the humanitarian response** to meet basic needs (Source: Handicap International, 2016)
- People with disabilities are **three times more likely to be denied access to health care** and have 10 to 20 years of less life expectancy (Source: WHO)

Climate change is a barrier that compounds and exacerbates disabilities.

Disability is an outcome of barriers

Disability = Impairment + Barriers

Why disability-inclusive energy access?

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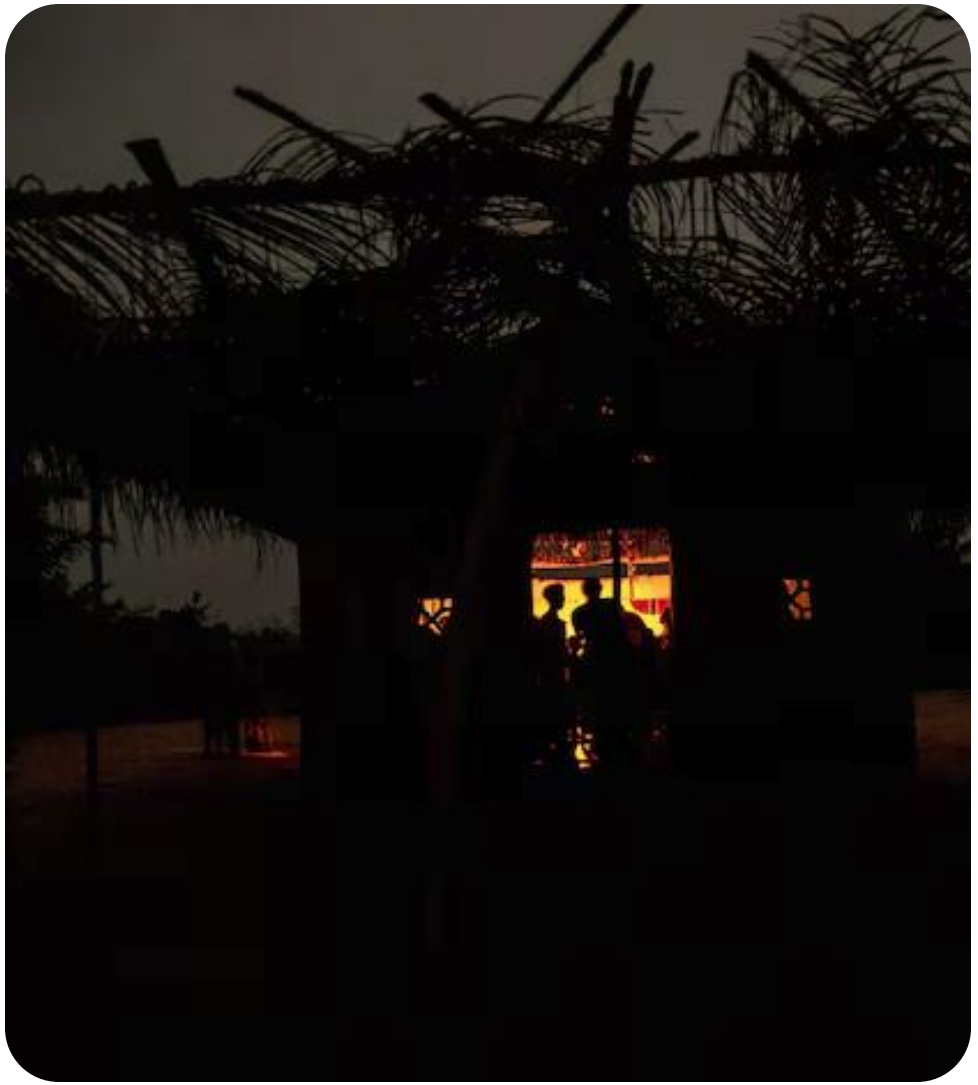
*"A lot of the time **we tend to naturally default to silos,** so we don't think of the intersection of disability and climate or the intersection of disability, climate, and gender because we're traditionally thinking of them as separate groupings or separate thematic areas".*

(Mary Keogh, CBM Global)



Source: Pascal Maître

Energy access interventions commonly look into clean, reliable, and affordable electricity **for households, public services, and economic activities.**

What about **access to sufficient energy for individuals (i.e. people with disabilities) with unique needs** due to various barriers?

Disability-inclusive energy access

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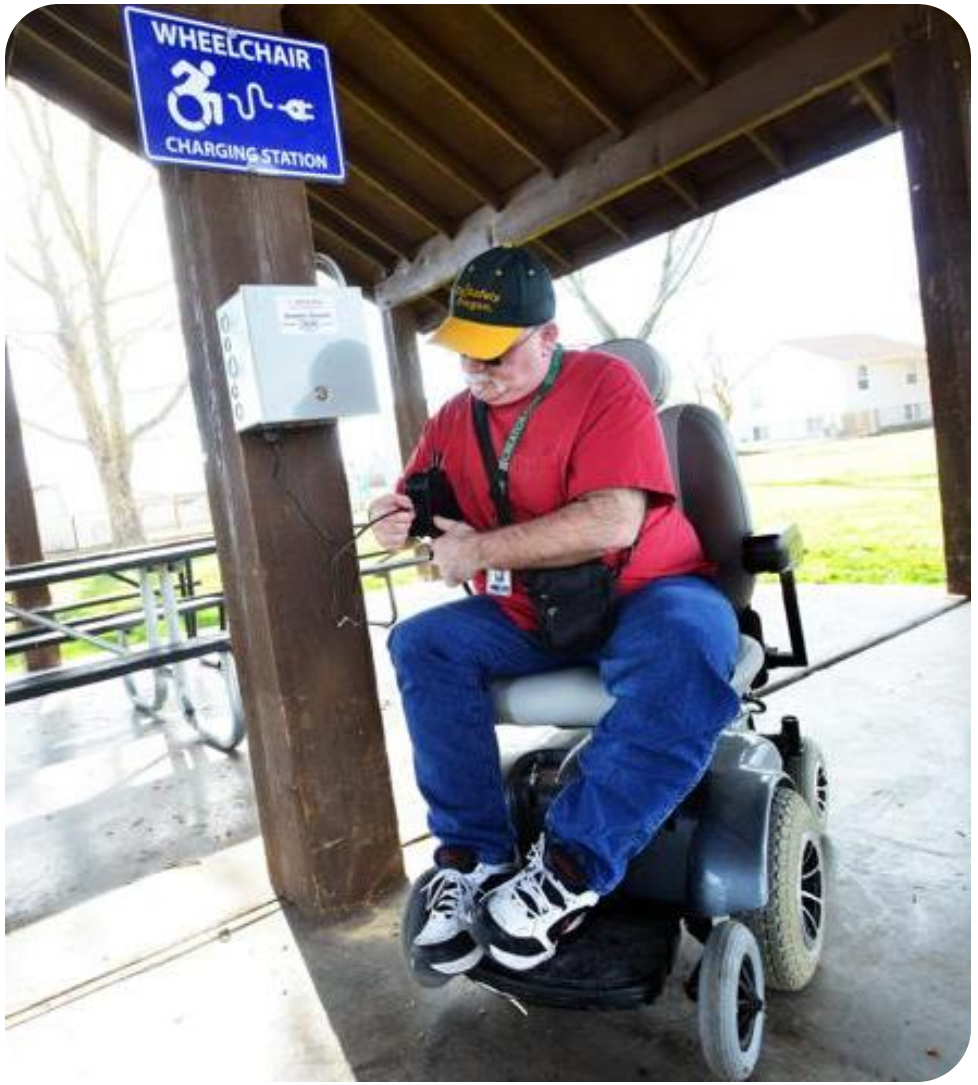
Disability insights

- **>44% WHO priority assistive products** need a battery (usually 'use-&-throw') or electric charging. (Source: WHO)
- Data from 15 LMICs shows significant association between **household energy poverty and child disability.** (Source: Stevens M, Yang-Huang J, Nieboer D, *et al*)

Disability can be a cause and consequence of energy poverty.

- This highlights the need for **proactive, targeted, disability-inclusive interventions as part of energy access programmes.**



Source: GilaniMobility

Why disability-inclusive energy access?

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UN Sustainable Development Goal 7

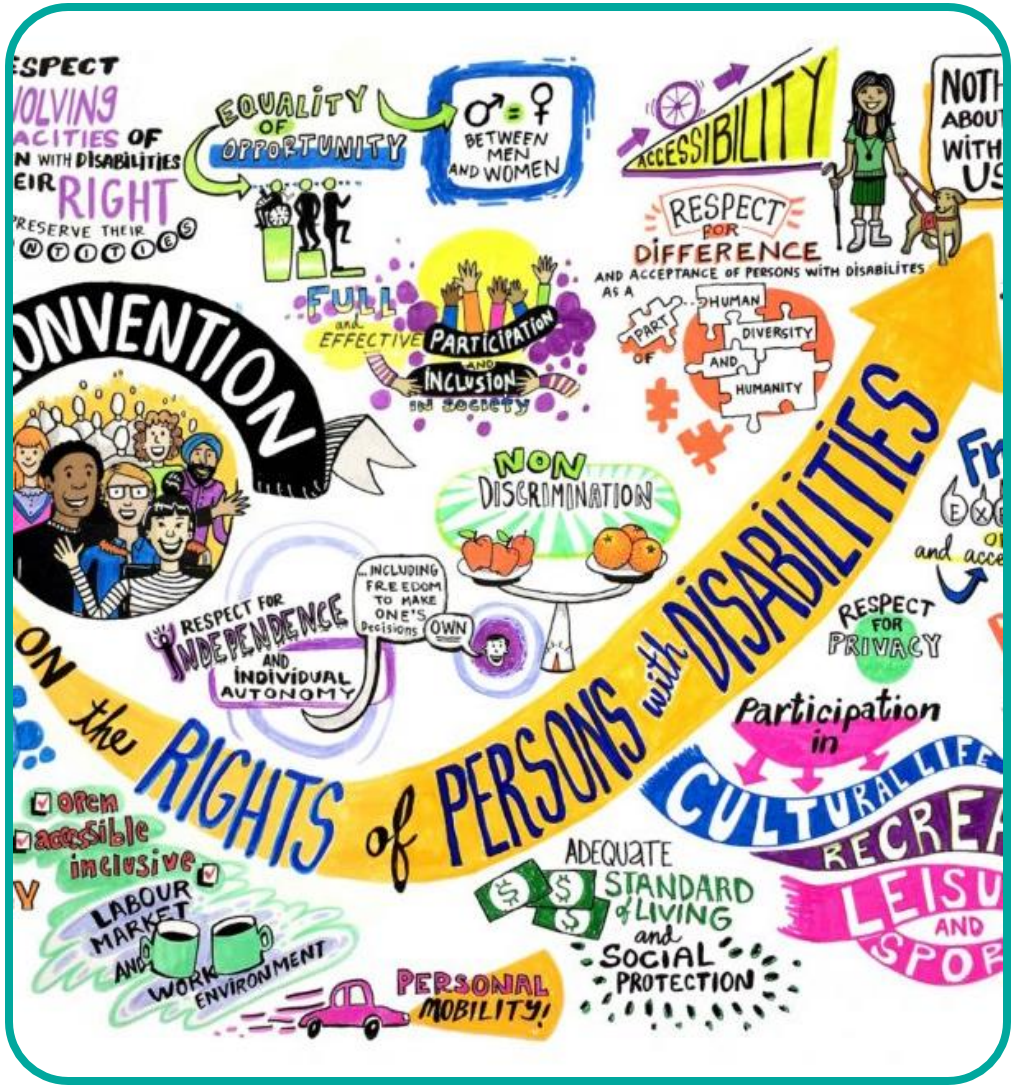
Target 7.1: By 2030, ensure **universal access** to affordable, reliable, and modern energy services.

UNCRPD Article 4(g)

To undertake or promote research and development of **universally designed goods, services, equipment and facilities,** [...] which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disabilities.

UK FCDO Disability Inclusion and Rights Strategy 2030

Towards 2030 we will promote clean energy which is **accessible to all.**



Source: ARC DLC, 2018

3 Barriers and Needs

Energy access barriers for people with disabilities

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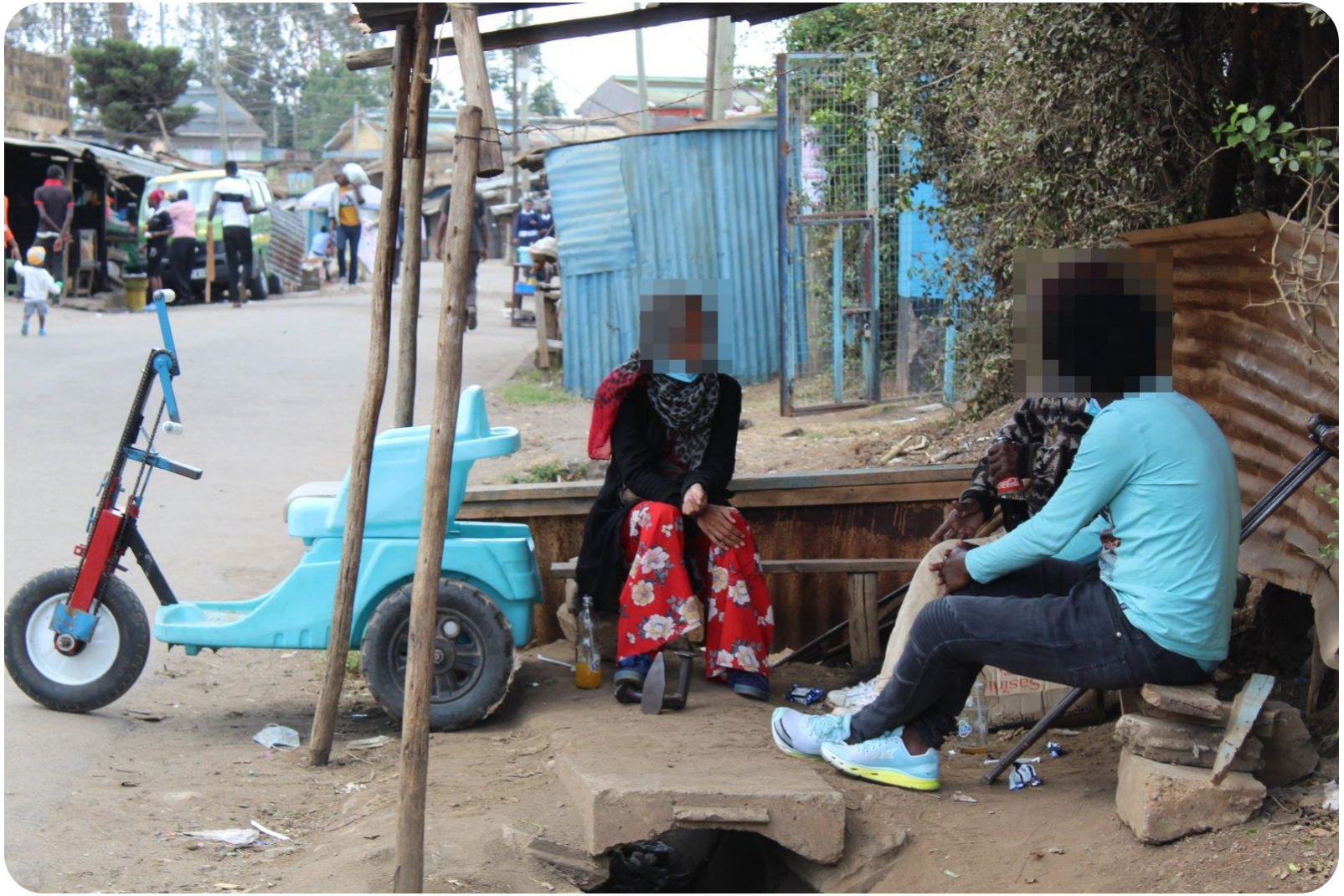
Common barriers to energy access:

- **Physical** – Obstacles in environment
- **Social** – Discrimination and stigma
- **Programmatic** – Inaccessible healthcare

Attitudinal, communication, policy, and transportation barriers may also exacerbate and compound the impact.

(Source: CDC)



Source: GDI Hub

Common barriers to energy access

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Physical barriers

- **Cause:** Many people with disabilities often live in **non-adapted housing units and spend more time indoors**
- **Consequence:** **Higher energy consumption** and **higher energy bills**

Social barriers

- **Cause:** People with disabilities commonly face **unstable careers, lower income, and insufficient social assistance**
- **Consequence:** Households with an economically inactive person with disability **consume 10% less energy, though have higher needs**

Programmatic barriers

- **Cause:** People with disabilities have **unreliable access to healthcare** devices, services, and assistive technologies, due to unreliable energy
- **Consequence:** Increases the **vulnerability to become energy poor**

Energy access needs for people with disabilities

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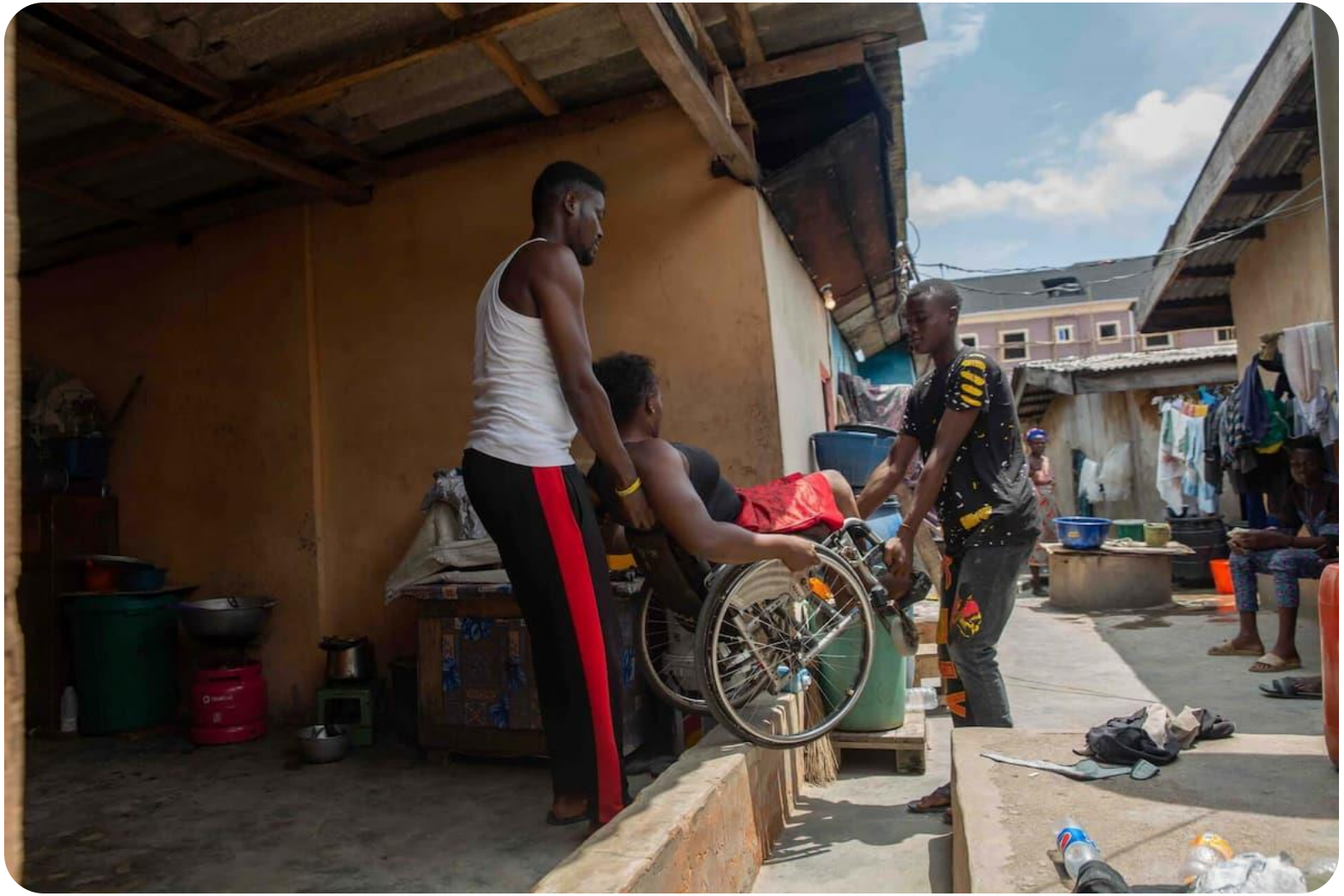
What is unique?

- Specialised medical care & AT requirements
- Increased time spent in home environments
- Limited livelihood opportunities
- Right to independent living

Let's discuss how these foundational characteristics link to energy access needs of people with disabilities.



Source: InaccessibleCities

Undisrupted, affordable, and clean energy

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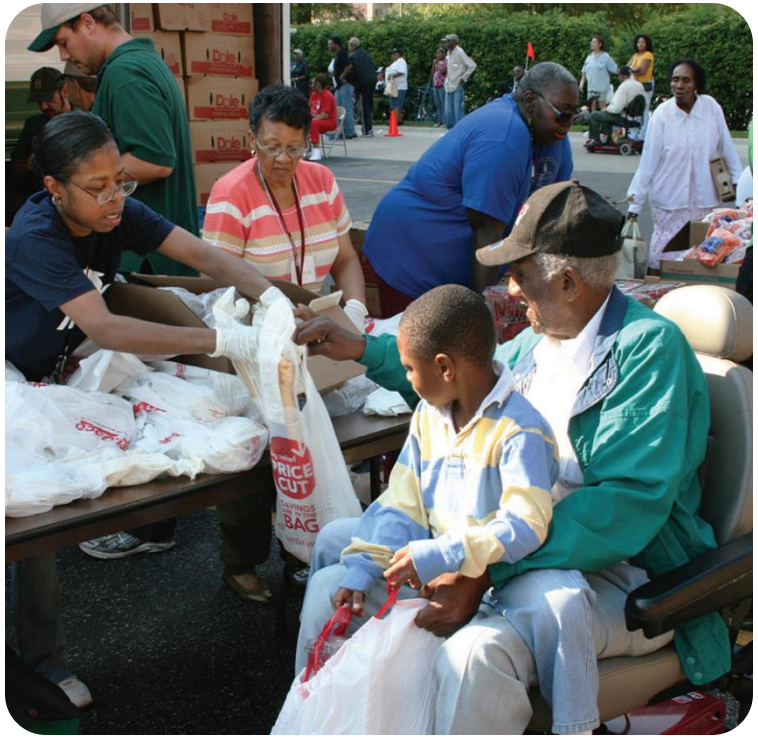
Undisrupted energy: To **charge and/or operate** AT, critical medical equipment, accessibility infrastructure, household and communication products.

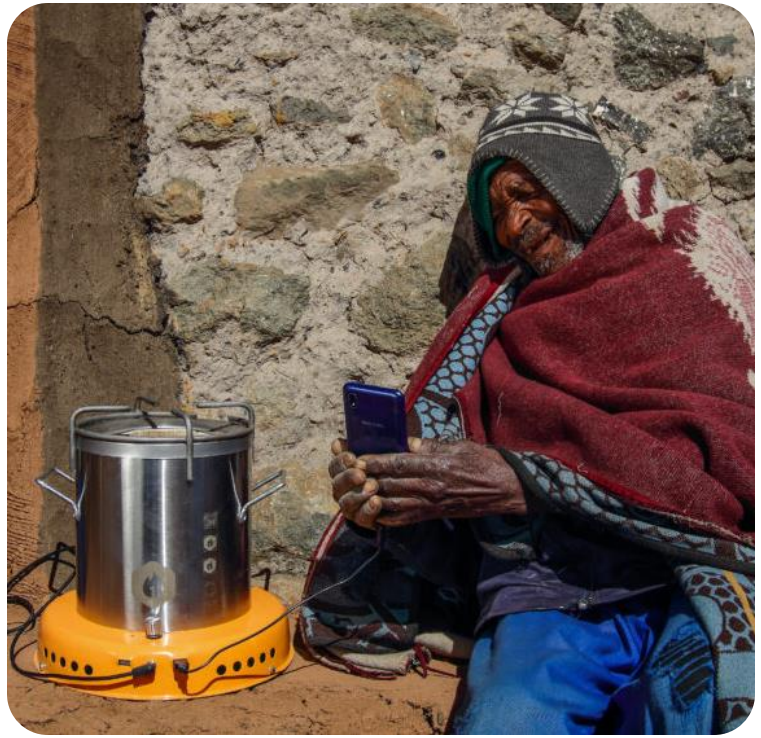
Source: Murdo MacLeod/The Guardian

Affordable energy: Households of people with disabilities are commonly **larger, poorer, and in rural areas, and are less likely to be early adopters.**



Source: GCFD

Clean energy: Access to **modern energy services/products for personal and household use,** to mitigate household pollution and health risks.



Source: Justice Kabale

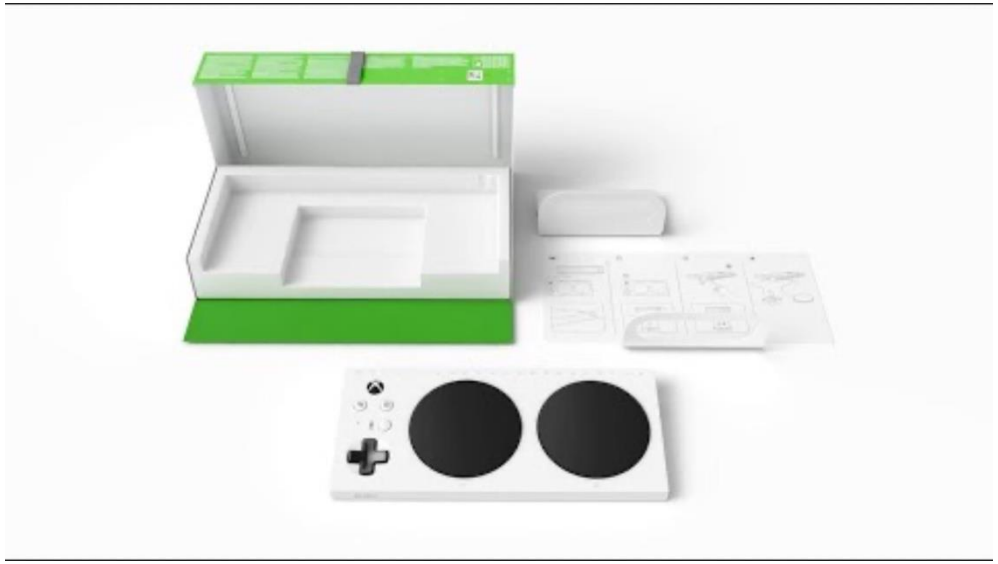
Enabling an inclusive energy transition

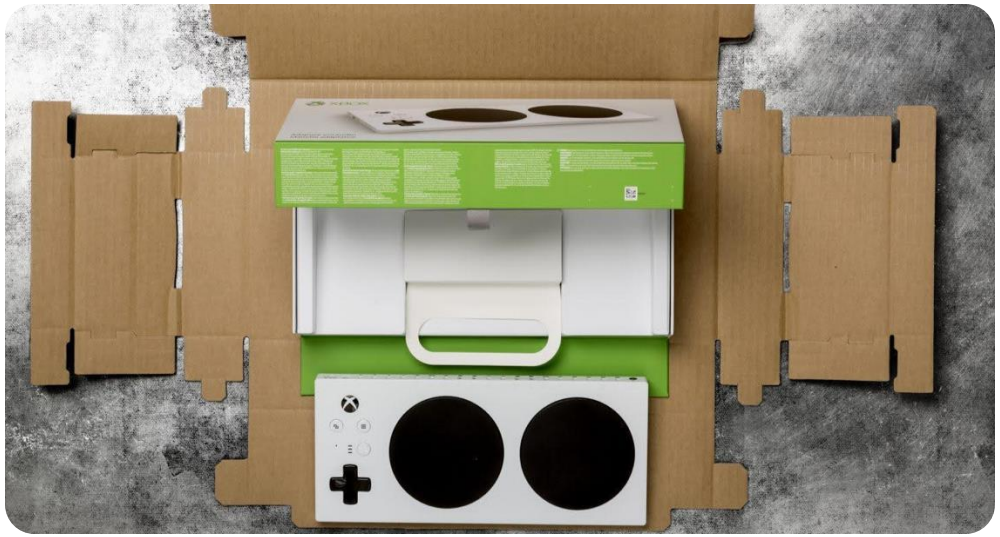
Global Disability Innovation Hub

Accessibility and inclusion are **not limited to reliable, low-cost, clean energy systems** and easy, flexible, and adaptable energy products/appliances.

Interface with product information, market, finance, demonstration, delivery, service, and feedback mechanism is key.

- People with disabilities as **passive end-users vs. consumers and co-designers**.
- **Integrating lived experiences of people with disabilities** across energy access innovation.





Xbox adaptive controller accessible packaging, Source: Microsoft

How could TEA partners embrace disability inclusion?

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Undisrupted energy

- Account **wellbeing and hygiene, food preparation, mobility, life support, and communication as basic needs** for people with disabilities while designing and installing off-grid energy systems.

Affordable energy

- Incentivise **early adoption of clean energy products and systems** and design dynamic energy pricing instruments to not restrict the usage of AT and medical equipment to low-priced hours/ seasons.

Clean energy

- Design **clean energy products/ appliances to meet accessibility requirements** and pursue targeted marketing and outreach.

Inclusive energy transition ecosystem

- **Integrate people with disabilities throughout the energy value chain** as leaders, employees, consumers, entrepreneurs, and community members.

4 Opportunities for Disability-inclusive Energy Access

Building a better and inclusive future

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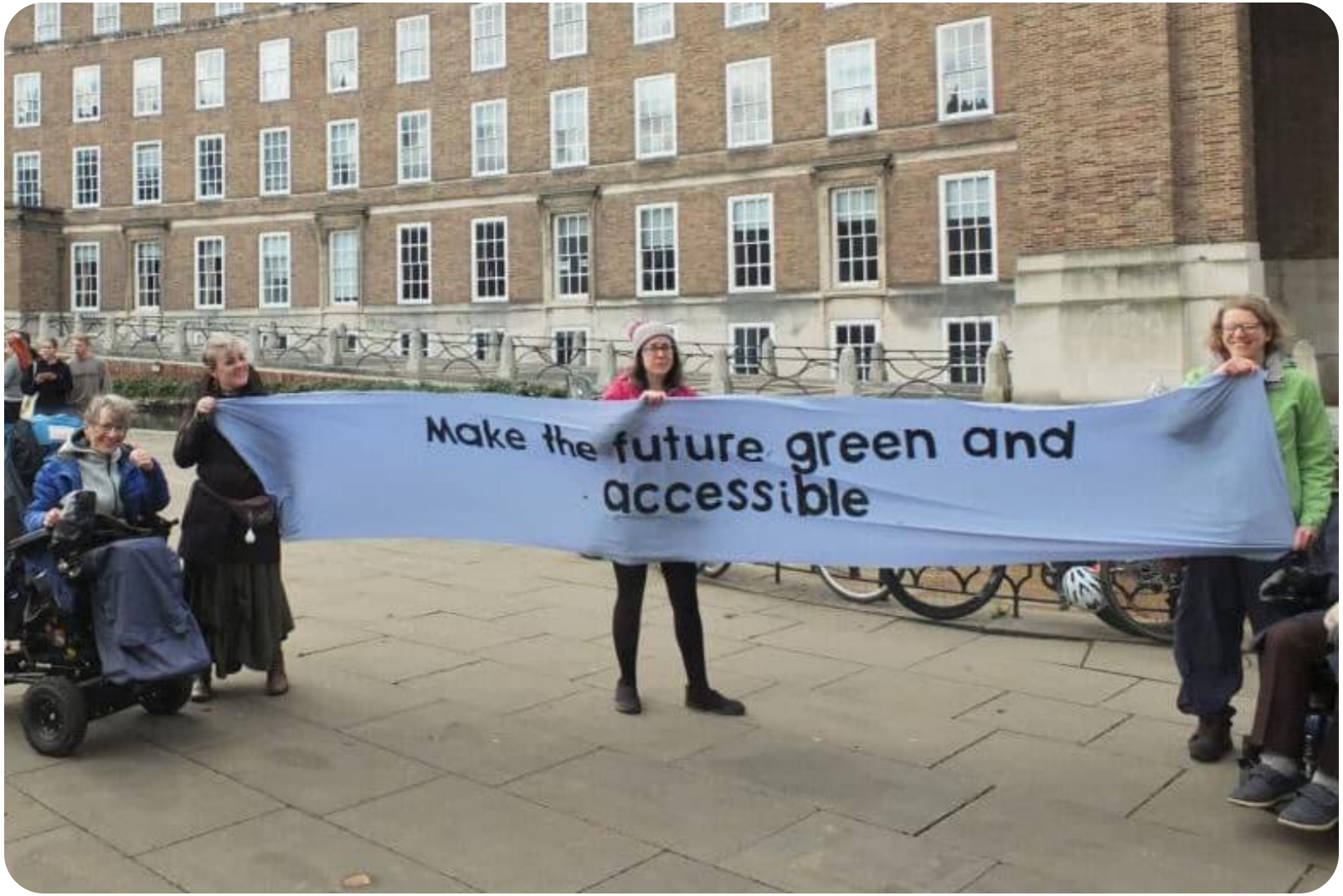
“Sustainable energy means opportunity. Opportunity means hope for a better future.”

Ahmad Alhendawi, United Nations Secretary General’s Envoy on Youth



Source: Bristol 24/7

Opportunities for disability-inclusive energy access

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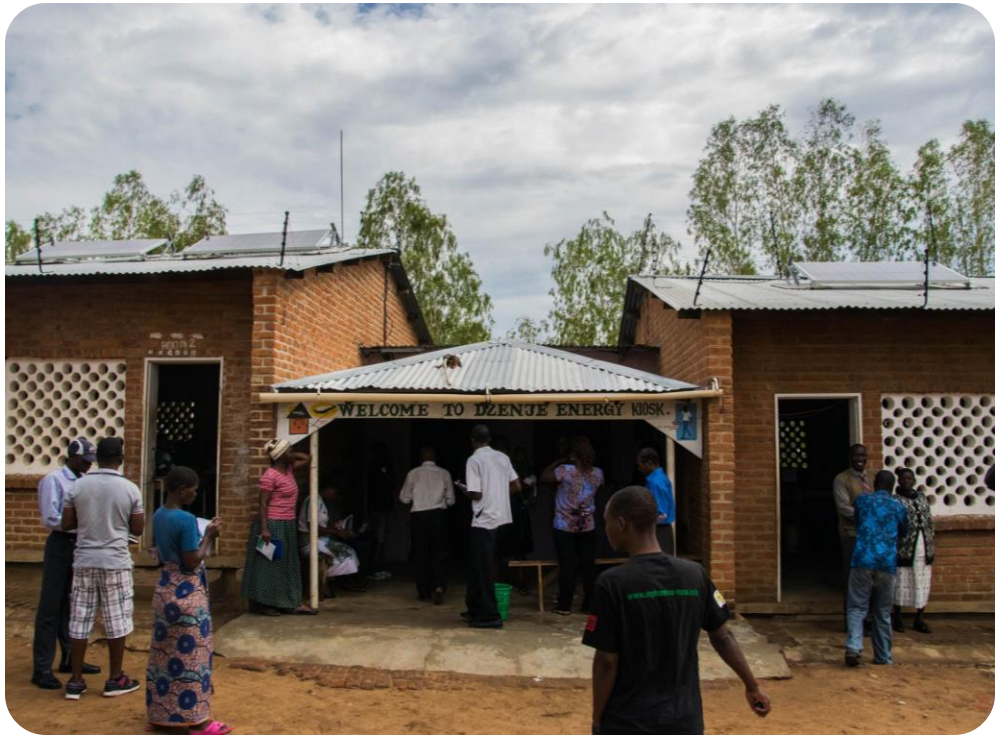
A. Sector-wide integration:

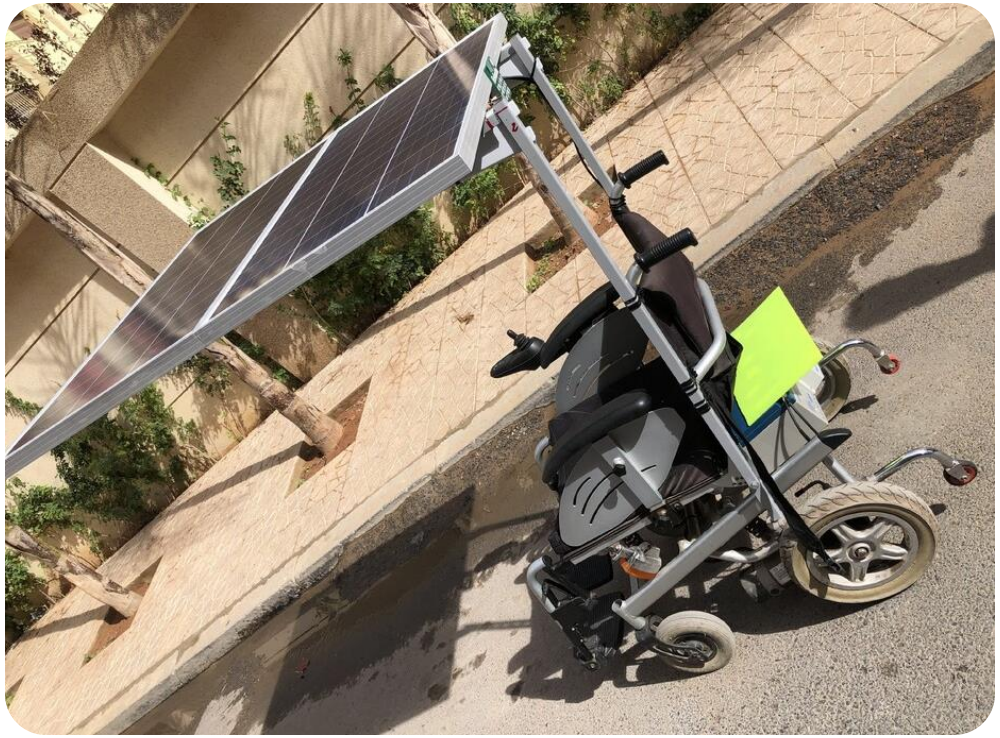
Mainstreaming disability inclusion across sectors for reducing or removing barriers.



Source: Mphamvu now

B. Powering AT: Energy access

stakeholders have a huge potential to further AT research, innovation, and reach.



Source: Heliantha

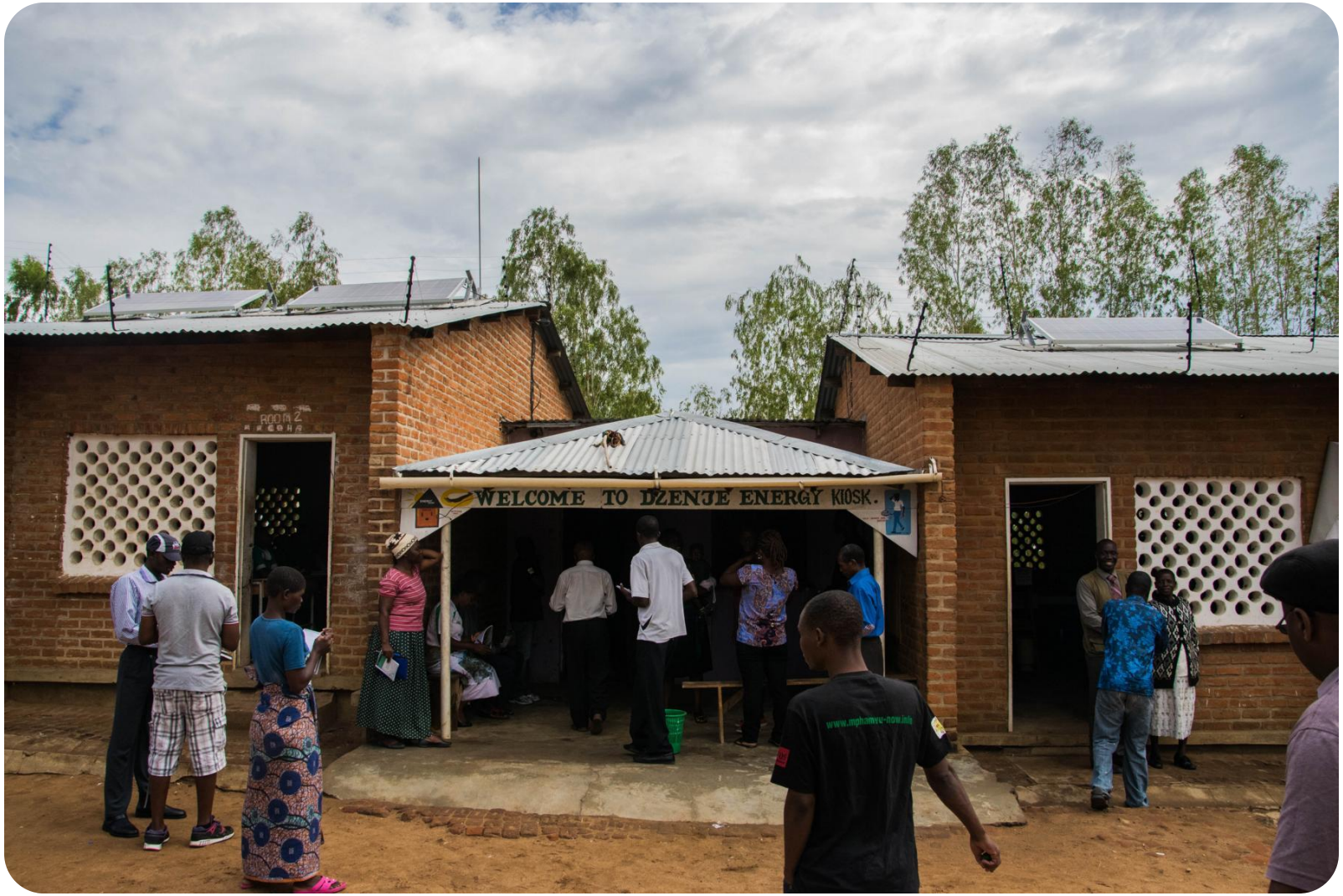
A. Sector-wide integration

Global Disability Innovation Hub

High-influence sectors/areas for TEA:

- Home appliances and ICTs
- Healthcare
- Transportation
- Green jobs

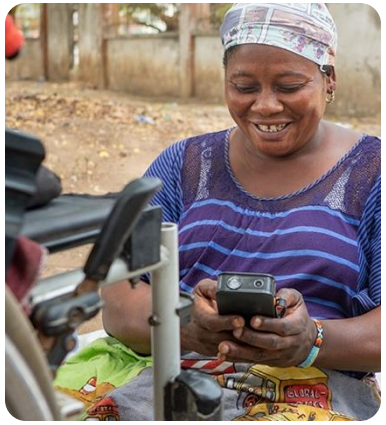
Education, humanitarian sector and reconstruction, built environment and cities, and energy infrastructure planning are other areas for opportunity.



Source: Mphamvu now

High-influence sectors/areas

Home appliances and ICTs – Tackling household energy poverty

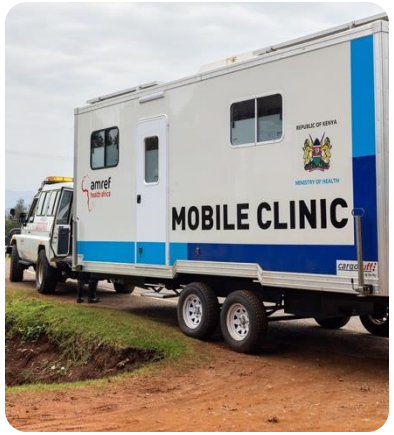


Source: GSMA

Clean energy products for cooking, cleaning, self-care and hygiene, and communication, to reduce risks of air pollution and impacts of high energy costs.

- Popularising **low-cost off-grid solar home systems**
- Adopting **inclusive design principles and accessibility standards,** including in promotional materials

Healthcare – Providing social protection and well-being



Source: AMREF

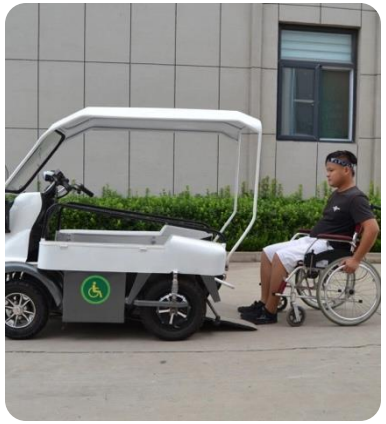
LMICs face a critical healthcare crisis linked to the energy crisis, as around a quarter of existing facilities do not have access to any form of energy.

- Local **solar mini-grids** for mobile clinics and ambulances
- Reliable **off-grid medical devices:** solar-powered refrigerators for vaccines, portable solar-powered ventilators, and solar autoclaves

High-influence sectors/areas

Global Disability Innovation Hub

Transportation – Enabling independent mobility

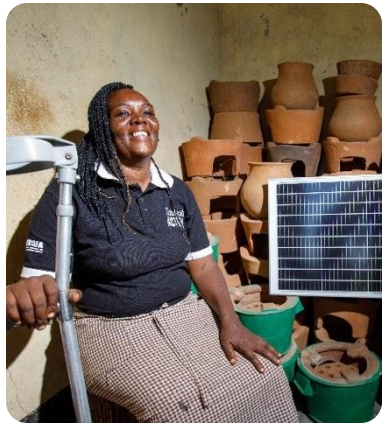


Source: NewEnergy.com

Public transport in LMICs are inaccessible, leading to people with disabilities reducing/restricting their trips, becoming captive users, or opting for high-cost PMVs.

- Designing accessible **electric vehicles** and charging infra.
- Innovation for accessible **micromobility options and demand-based taxi/paratransit aggregator services.**

Green jobs – Addressing un(der)employment



Source: Practical Action

Clean energy sector is expected to create 8-18 million jobs, by 2030. People with disabilities could be empowered as leaders, employees, and entrepreneurs (Source: WEF).

- Creating targeted **localised entrepreneurial opportunities**
- Offering **equal employment opportunities** for people with disabilities, through collaboration with local OPDs

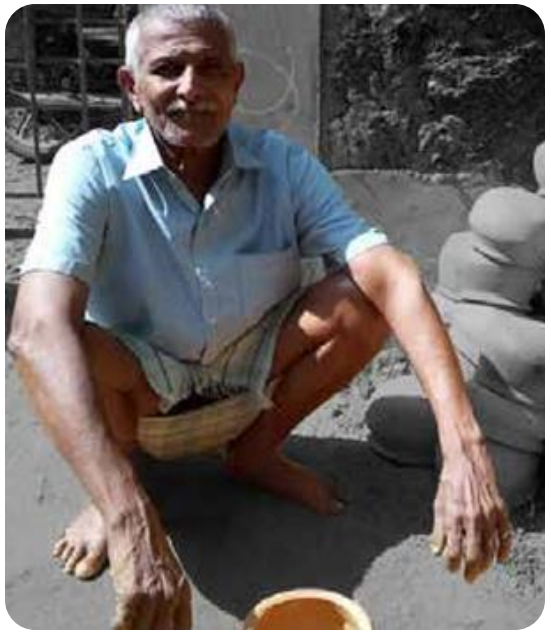
Productive use of renewable energy – Case study

Global Disability Innovation Hub

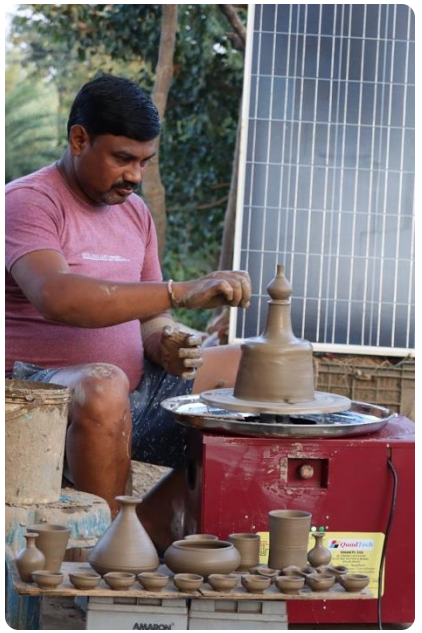
SELCO Foundation **integrates solar energy solutions with assistive devices to improve the quality of life for individuals with disabilities**.

- Improves mobility and independence for users
- Provides a livelihood and source of income
- Promotes sustainable assistive devices, with a focus on solar energy

Projects include solar-powered mobility devices like **tricycles and wheelchairs**, as well as solar-powered **roti rolling machines**.



Source: SELCO



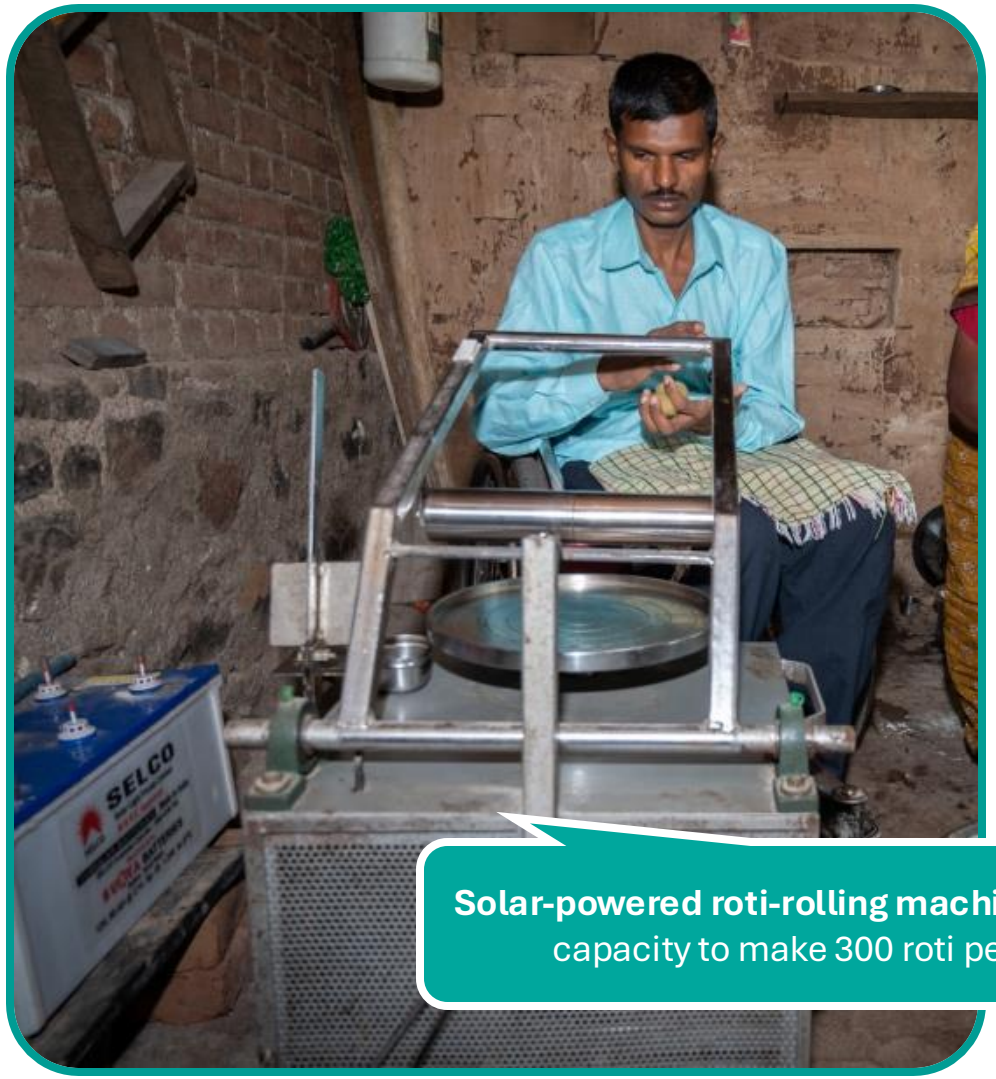
Source: India Mart

Ramachandra is a blind potter from Kumta who lost his eyesight 25 years ago. He moved from a **manual to a solar-powered pottery wheel and blunger.**

- Reduced drudgery
- Increased productivity and income

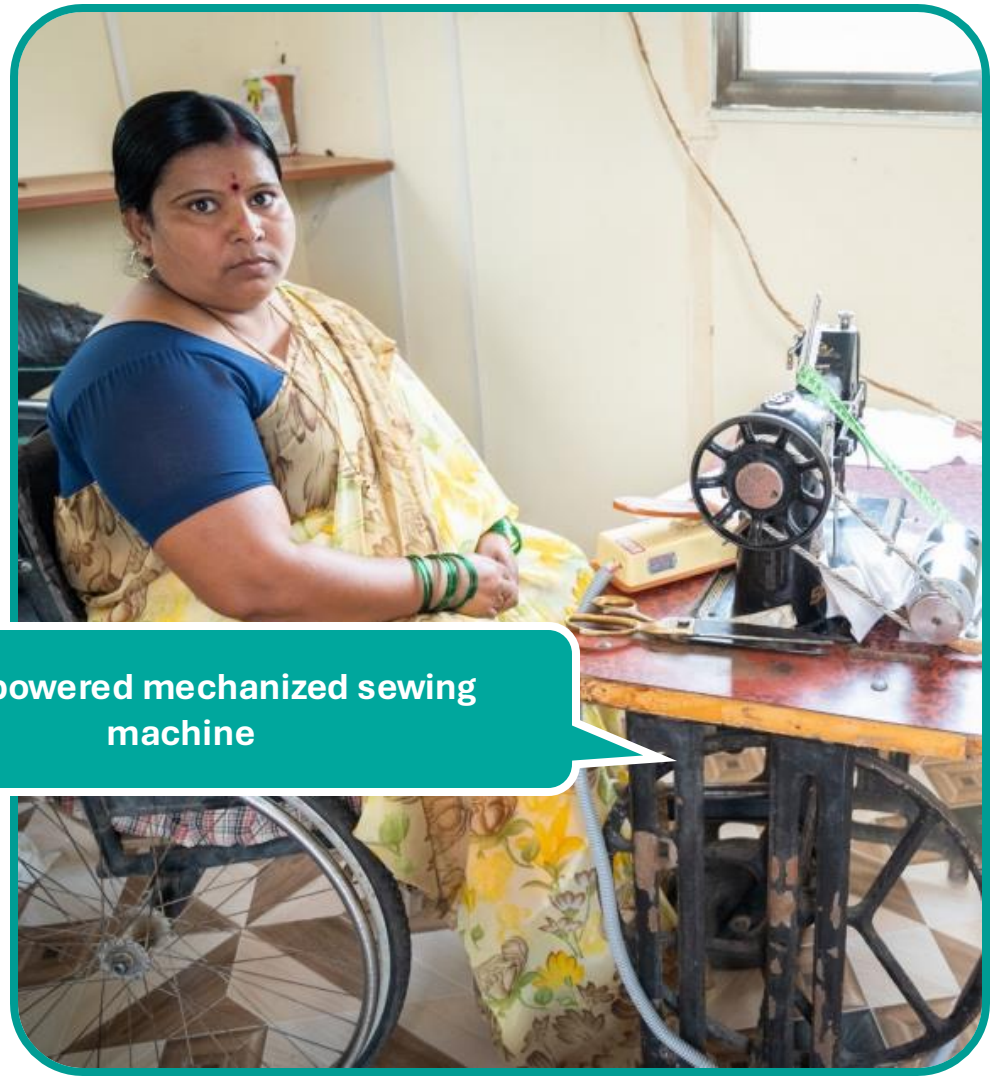
Productive use of renewable energy – Case study

Global Disability Innovation Hub



Solar-powered roti-rolling machine with the capacity to make 300 roti per day

Source: SELCO



Solar-powered mechanized sewing machine

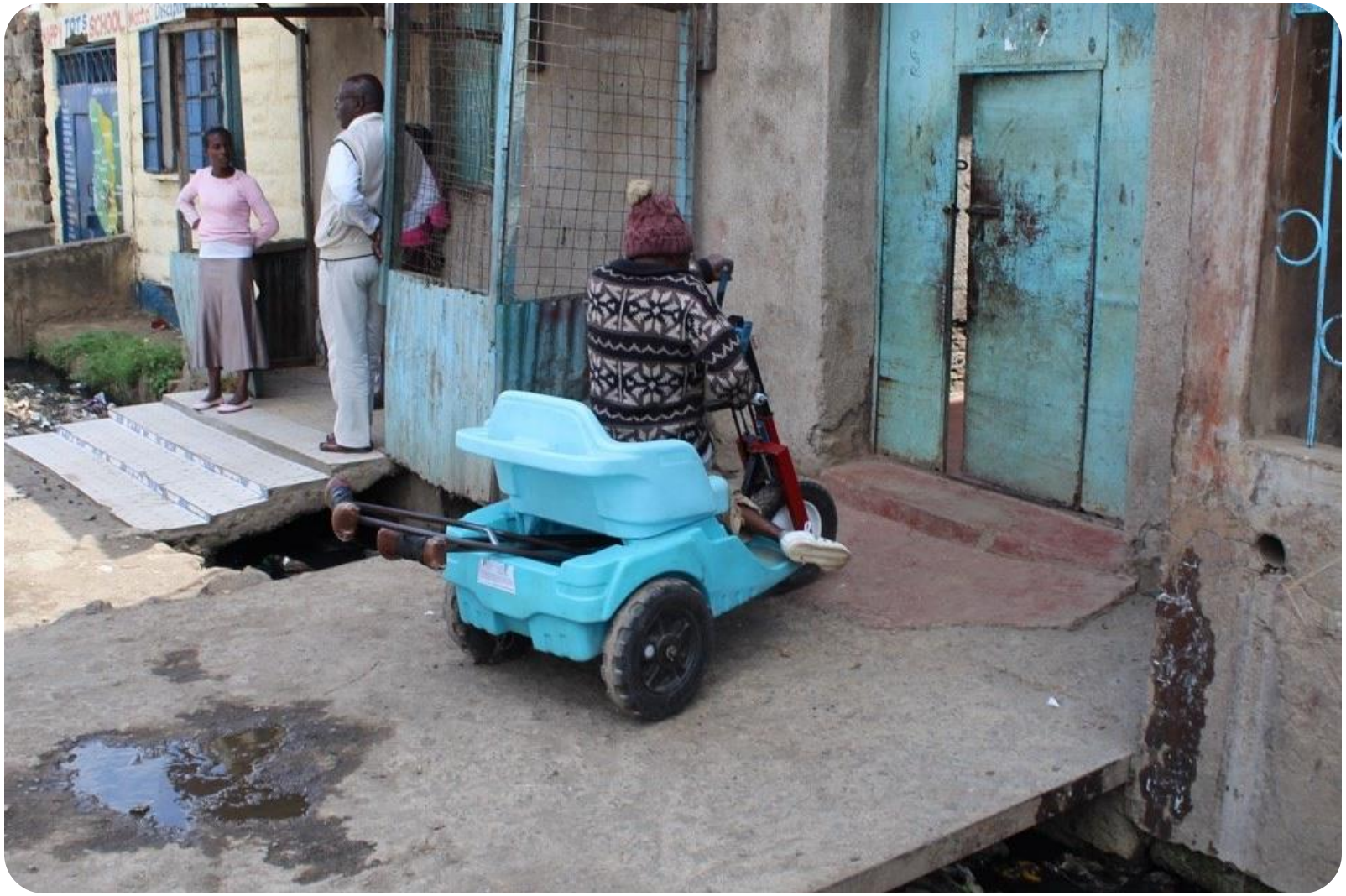
Source: SELCO

B. Powering assistive technology

Global Disability Innovation Hub

Assistive technology and products directly improve the five broad areas of energy need for people with disabilities—**including wellbeing and hygiene, food preparation, mobility, life support, and communication**—and pave the way for equal participation.

Globally, only around **10% of people with disabilities** who need an assistive product have access to them.



Source: GDI Hub

Expanding the market opportunities and reach of AT

Affordable and sustainable adaptations or alternatives for the **22 energy-based, WHO-listed priority assistive products are** an opportunity for research, business, and impact (Source: WHO).

- **The AT2030 Programme led by GDI Hub and funded by UK Aid focuses on research and delivery for five of the fifty products from the WHO-priority AT list:** hearing aids, prostheses, wheelchairs, eyeglasses, and assistive digital products and software.

- Alarm signallers with light/sound/vibration
- Audio players with DAISY capability
- Braille displays (note takers)
- Closed captioning displays
- Communication software
- Deafblind electronic communicators
- Fall detectors
- Gesture to voice technology
- Global positioning system (GPS) locators
- Hearing aids (digital) and batteries
- Hearing loops/FM systems
- Keyboard and mouse emulation software
- Magnifiers, digital hand-held
- Personal digital assistant (PDA)
- Personal emergency alarm systems
- Prostheses, lower limb (not all)
- Recorders
- Screen readers
- Simplified mobile phones
- Video communication devices
- Watches, talking/ touching
- Wheelchairs, electrically powered

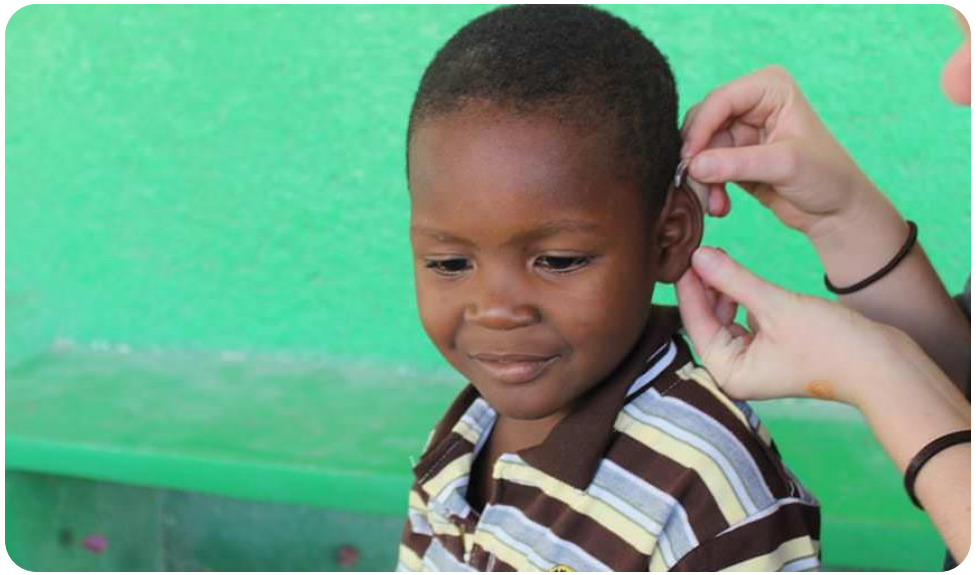
Energy innovation for assistive products – Case study

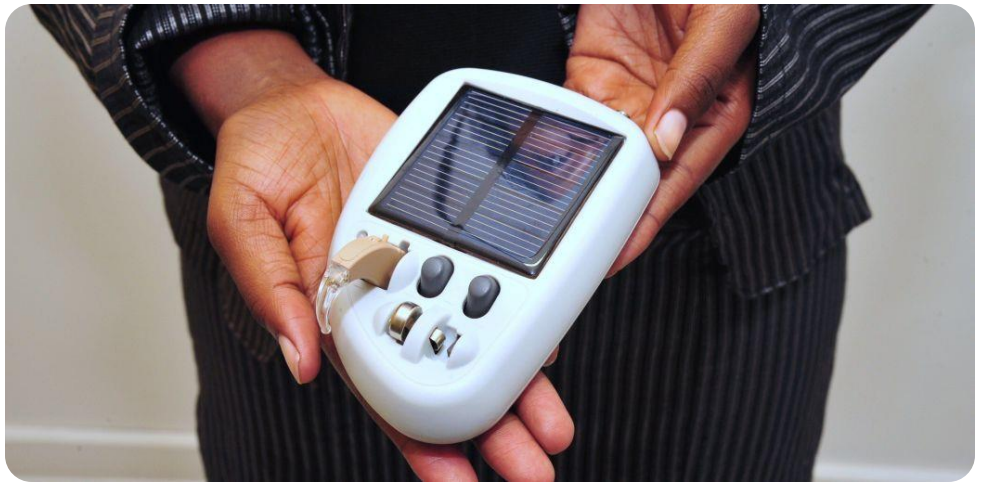
Global Disability Innovation Hub

More than **200 million people** from low- and middle-income countries have hearing impairments

Given they all use hearing aids with non-rechargeable (disposable) zinc-air batteries **7.3 billion batteries will be generated as e-waste per year,** assuming 5-10 days as the average life-time per battery.

High capital cost as an impediment for adoption, **high operations cost** leading to discontinued use, and **high e-waste generation** are the key challenges that need to be addressed.





SOLAR EAR

Solar Ear manufactures **affordable, solar rechargeable** hearing aids. The products are manufactured by local deaf people in Brazil, Botswana, and China and exported all over the world.

Source: Ears for Years, Healthy Hearing

How could TEA partners leverage these opportunities?

Global Disability Innovation Hub

Product-level

- **Account for unique energy needs** of individuals
- **Mainstream inclusive design** and accessible user interface
- **Enable** choices, autonomy, **independent living**

Programme-level

- **Explicitly include people with disabilities** in energy access policies and distribute benefits equitably
- **Collect disability-disaggregated data** for monitoring

System-level

- **Recognise and respond to social barriers,** including stigma and lower livelihood opportunities.
- **Build disability confidence** through capacity building and partnerships with OPDs.

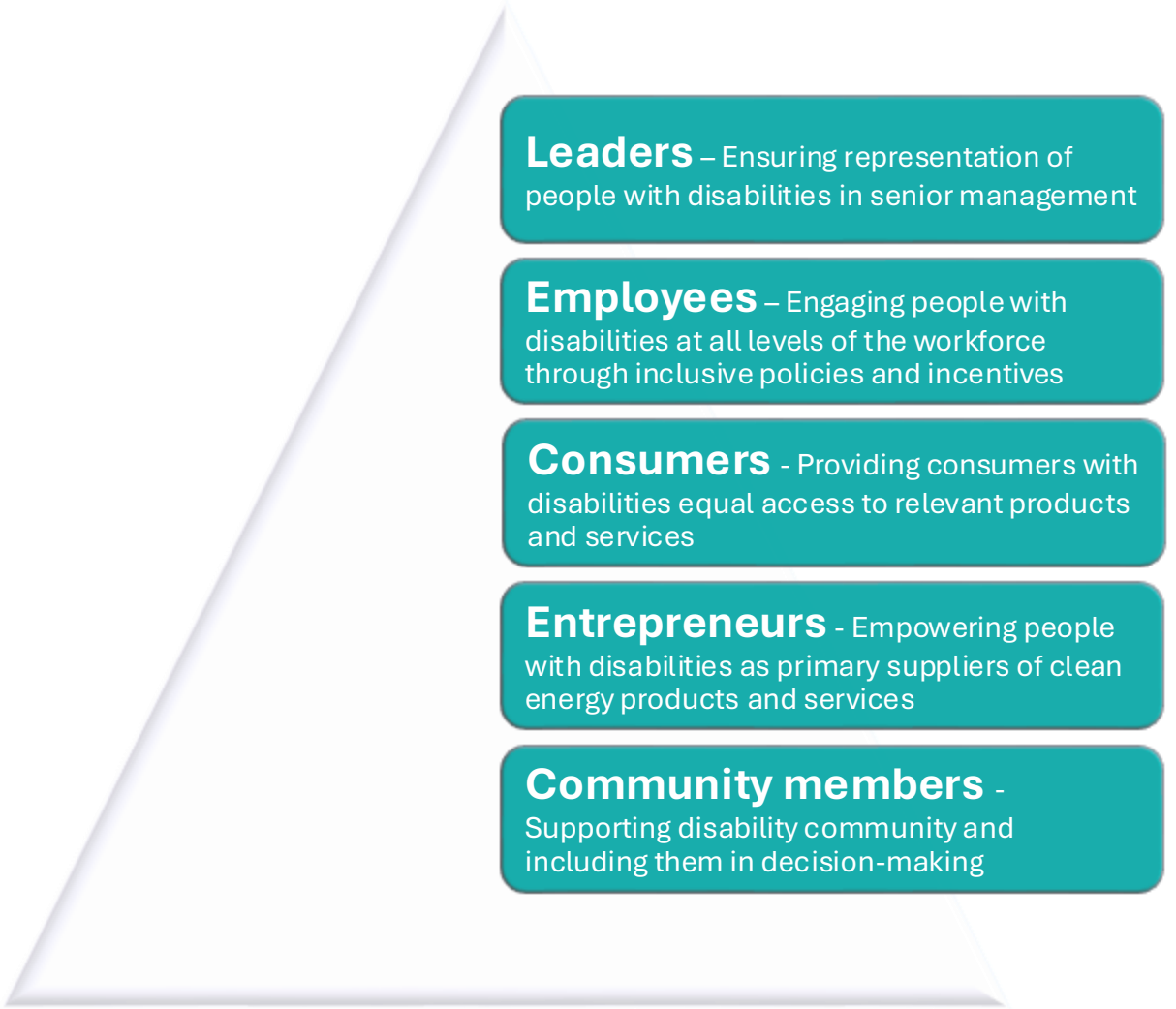
Including people with disabilities in clean energy value chain

Global Disability Innovation Hub

The first step for change is to recognise and include people with disabilities as part of the clean energy value chain by adopting the five-tier investment pyramid.

Do not miss out on customer base:

- **Conduct disability-focused feasibility and performance studies** for relevant clean energy products and services
- **Capture lived experiences of disability** to inform energy access programmes



Source: IFC

5 Summary and Next Steps

Module 5: Key takeaways

Global Disability Innovation Hub

With climate change, disability could be a cause and consequence of energy poverty

- Recognizing access to **sufficient energy** for individuals with unique needs (i.e. people with disabilities)

Undisrupted, affordable, and clean energy as well as an enabling energy ecosystem are key for inclusion

- Energy access interventions could **reduce and remove barriers**

Energy access programmes can expand the market opportunities and reach of assistive technology and products.

- People with disabilities are **current and prospective customers** for clean energy products, services, and systems.
- **Include people with disabilities** as leaders, employees, consumers, entrepreneurs, and community members

Suggested Actions for TEA Partners:

- Mainstream disability inclusion lens across TEA **programmes and operations.**
- Prepare **GEDSI Action Plan**

Next steps

Global Disability Innovation Hub

Triage clinics and technical assistance:

TEA Partners can now **book one-hour appointments** with the GDI Hub team to discuss any questions or ideas on disability inclusion and innovation. 1-2-1 technical assistance support is also available from the GDI Hub team.

Scan the QR code to book your slot or email b.nagendran@ucl.ac.uk

Thank you!