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A Path towards a Sustainable Future

Energising the Future with Sustainable Impact
EnDev Bangladesh

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EnDev: A Global Energy Access Initiative

The global energy access programme Energising Development (EnDev) began in 2005 as a partnership between the Dutch Ministry of Foreign Affairs (DGIS) and the German Federal Ministry for Economic Cooperation and Development (BMZ). The initiative was created to expand access to clean and modern energy for low-income and rural communities in developing countries. EnDev has evolved into a multi-donor programme and currently co-funded by Germany, the Netherlands, Switzerland, and Norway, and continues to play a leading role in advancing inclusive and sustainable energy solutions around the world.

EnDev in Bangladesh

EnDev officially launched its operations in Bangladesh in 2009, implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

However, the roots of this work in Bangladesh go back to 2005, when the Bangladesh-German cooperation started piloting clean and renewable energy initiatives. These early efforts focused on clean cooking technologies and solar energy solutions, which later became core components of the EnDev programme in Bangladesh.

Since then, EnDev has been supporting millions of households and communities across Bangladesh to access clean, modern, affordable and reliable energy, contributing to better health, economic opportunities, and environmental protection.

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1 IMPROVED BIOMASS COOKSTOVES AT SCALE (2009–2025)

Improved Biomass Cookstoves (2009 – 2023)

In many homes across Bangladesh, families still cook using traditional stoves that burn firewood or other biomass. These stoves often use more fuel than needed and produce a lot of smoke inside the kitchen. Indoor smoke from cooking affects the air we breathe and is linked to around 70,000 premature deaths every year in Bangladesh, especially affecting women and children. Traditional stoves also require large amounts of firewood, which puts pressure on our forests and natural environment. By moving towards cleaner and more efficient cooking solutions, households can enjoy healthier kitchens, reduce fuel costs, and help protect our forests for future generations.

The Beginning of a Cleaner Cooking Movement

In the early 1980s, the Bangladesh Council of Scientific and Industrial Research (BCSIR) developed improved cookstove designs to help families cook more efficiently and with less smoke. Building on this foundation, GIZ Bangladesh selected one of these models, added a chimney, and further improved the design. In 2006, this cleaner and more efficient stove was introduced to households across the country under the name Bondhu Chula (meaning 'friendly stove').

This improved biomass cookstove is scientifically designed to burn fuel efficiently and significantly reduce indoor smoke, contributing to better health and a cleaner environment.

From the start of its journey, EnDev helped spread this technology across Bangladesh by working with more than 250 partner NGOs. At first, the stoves were made from mud, but in 2010, a durable concrete model was introduced to ensure quality and long-term use. Special molds were provided to partner organisations so they could produce the stoves locally.

To build a strong and sustainable market, more than 5,000 local sanitary shops were engaged to promote and supply the improved biomass cookstoves nationwide.

A major milestone came in 2012, when EnDev, together with the Department of Environment (DoE) and support from the Bangladesh Climate Change Trust, facilitated the installation of 500,000 improved stoves across the country – a remarkable achievement for a development programme in Bangladesh.

Supporting Bangladesh Bondhu Foundation

To manage and expand the growing demand for improved biomass cookstove named as Bondhu Chula and to strengthen clean cooking efforts in Bangladesh, EnDev supported the establishment of the Bangladesh Bondhu Foundation (BBF) in 2015. BBF is an independent, non-governmental, and non-profit organisation dedicated to promoting clean and efficient cooking solutions across the country.

Since its establishment, EnDev has supported BBF by:

Over time, BBF has grown into a strong national organisation and has also attracted support from other partners. Beyond clean cooking, BBF now also works in areas such as forestry, agriculture, and safe drinking water to support healthier and greener communities.

Introducing Higher-Tier Improved Cookstoves (2019–2020)

To promote even cleaner and more efficient cooking solutions, EnDev supported the introduction of higher-tier biomass improved cookstoves in selected districts between 2019 and 2020.

Working with 20 local stove manufacturers – including partners of BBF and Infrastructure Development Company Limited (IDCOL) – EnDev facilitated the installation of 2,000 improved cookstoves that met at least Tier-2 international performance standards.

Tier 2: biomass cookstove

1. Thermal efficiency ≥ 25%
2. Indoor emission ≤ 11 (g/MJd)
3. Safety (score) ≥ 75

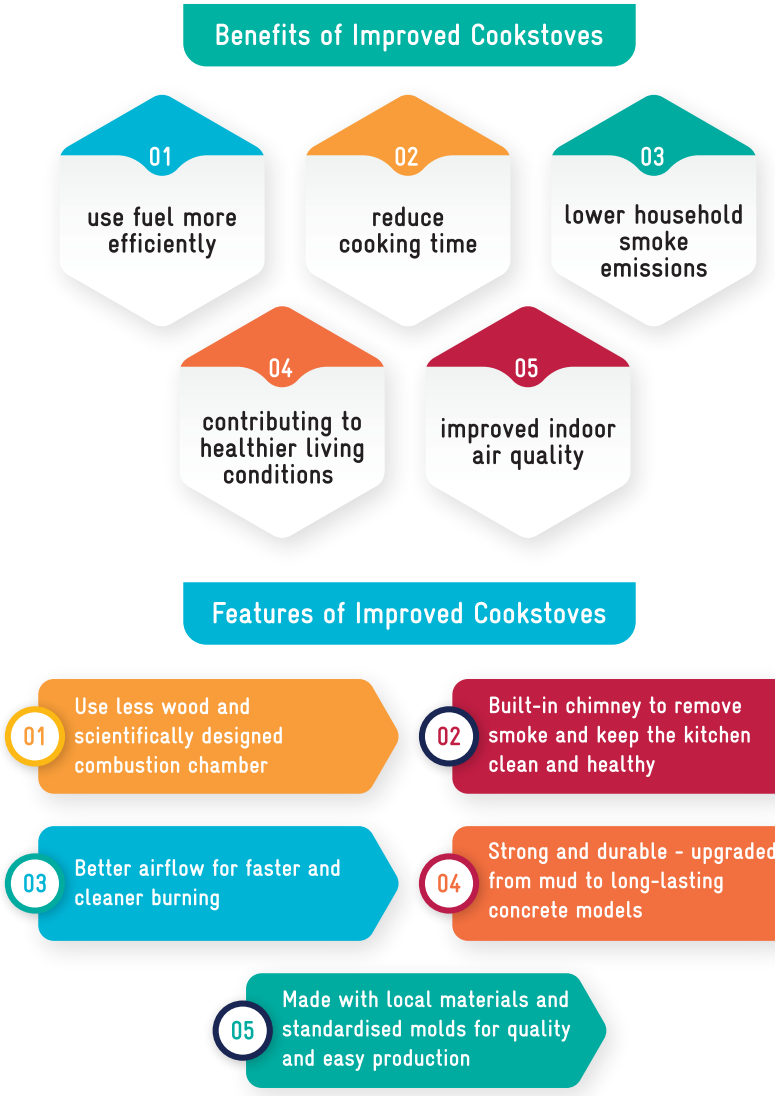
A variety of models were supported to give households suitable choices. These included both fixed and portable designs, made from metal or concrete, and with or without chimneys, as long as they met the required efficiency and emission standards.

This initiative helped introduce more advanced clean-cooking options to communities and encouraged local manufacturers to adopt higher quality technologies.

Empowering Indigenous Communities with Cleaner Cooking Solutions (2023 – 2025)

Under EnDev's **Leave No One Behind (LNOB+)** initiative, special attention has been given to supporting indigenous communities living in the flatland areas of Rajshahi Division in north-western Bangladesh. These communities often have limited access to clean and modern energy services.

To improve energy access, EnDev partnered with two local NGOs (AVA Development Society and Ashrai) to disseminate Tier-2 improved biomass cookstoves.



A key focus has been women's empowerment. A total of 400 women from these communities were trained in stove installation, maintenance, and sales. Many of them are now earning income by offering clean-cooking services within their villages.

Through these efforts, 8,300 improved cookstoves have been introduced, contributing to cleaner kitchens, healthier families, and enhanced livelihood opportunities, ensuring that every community is included in Bangladesh's clean-cooking transition.

2 BIOGAS: TURNING WASTE INTO CLEAN ENERGY

(2009 – 2010)

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Biogas is an important renewable energy source that converts organic waste into useful cooking fuel and, in some cases, electricity. Biogas digesters use materials such as cow dung, poultry litter, and other organic waste to produce gas.

The gas mainly contains methane and carbon dioxide, with methane usually making up 50–60%. Although this is lower than the methane level in natural gas, biogas still serves as a valuable clean energy alternative and helps reduce the use of natural, non-renewable fuels.

An added benefit of biogas systems is the organic fertilizer, called slurry, that comes out as a by-product. This nutrient-rich fertilizer supports sustainable farming and improves soil quality.

Over the years, several organisations - including BCSIR, IDCOL, and GIZ through the EnDev programme - have helped expand biogas use in Bangladesh. EnDev has focused mainly on commercial biogas plants, supporting small and medium dairy and poultry farms with the installation of about 1,100 biogas digesters. This has enabled many rural households to access reliable and affordable clean cooking fuel. In addition, EnDev has trained technicians to construct biogas plants and organised knowledge-sharing programmes to strengthen capacity and coordination in the biogas sector.

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3 LIGHTING RURAL HOMES WITH SOLAR HOME SYSTEM (SHS) & SMALL SOLAR HOME SYSTEM (SSHS)

(2009–2017)

Bangladesh has limited natural resources for electricity generation and has historically depended on imported fuel. To strengthen energy security and ensure access to electricity for all, the Government of Bangladesh has prioritised the development and expansion of renewable energy solutions.

From the start of its work in Bangladesh, EnDev has focused on expanding access to solar energy, especially in remote villages where the national grid had not yet reached. To achieve this, EnDev partnered with the IDCOL- a leading government-linked financial institution that manages one of the world's largest and most successful solar home system programmes.

Through IDCOL's network of partner organisations, EnDev supported the installation of both SHS - up to 150 Wp and SSHS - 10 or 21 Wp, based on the needs and affordability of rural households.

With this collaboration, more than 130,000 solar home systems were installed across off-grid regions of Bangladesh, bringing clean, reliable light and power to families, improving study and work opportunities, and contributing to rural development.

4 BRINGING LIGHT THROUGH SOLAR LANTERNS (Pico PV)

(2013 – 2018)

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To make clean and affordable lighting accessible to families and small businesses in off-grid rural areas, EnDev introduced solar lanterns (Pico PV systems) as a simple and reliable solution. These small, portable solar lights are especially useful for households that cannot afford larger solar systems.

In partnership with the Foreign, Commonwealth & Development Office (FCDO) Bangladesh, formerly known as DFID, EnDev implemented a Results-Based Financing (RBF) programme to expand the distribution and market uptake of solar lanterns up to 10 Wp capacity, especially targeting low-income and remote communities. Through this effort, more than 8,200 solar lanterns were distributed including many provided to school children and to Rohingya refugee families to support safe lighting and education.

EnDev worked with 10 private companies and NGOs to supply and promote these lanterns, and partnered with Collaborative Labeling and Appliance Standards Program (CLASP) to ensure product quality, testing, and awareness on energy-efficient appliances. Additionally, in collaboration with International Finance Corporation (IFC), EnDev supported the Lighting Bangladesh initiative, helping build a sustainable market for energy-efficient lighting in off-grid regions.

By bringing safe, clean light to rural households, this initiative helped children learn, reduced the need for polluting kerosene lamps, and created safer, brighter evenings for families and communities.

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5 SUPPORT – SECTOR NETWORK HOUSEHOLD ENERGY PLATFORM (HEP)

(2016 – 2018)

In 2013, the Government of Bangladesh introduced the Country Action Plan for Clean Cooking, supported by EnDev, the Clean Cooking Alliance (CCA), and other partners. A key recommendation of the plan was to create a national platform to coordinate clean cooking efforts across government, development agencies, the private sector, and civil society.

To support this vision, EnDev – together with the Netherlands Enterprise Agency (RVO) and CCA helped establish the HEP in 2016. HEP was created as a common platform for dialogue, knowledge-sharing, and sector coordination. The platform was hosted by the Sustainable and Renewable Energy Development Authority (SREDA), the government agency responsible for renewable energy and energy efficiency.

HEP served as a central hub for information and collaboration in the clean cooking sector. Six technical sub-committees were formed to address different thematic areas, with EnDev actively contributing to the Fuel and Research & Testing groups.

In 2018, under the leadership of SREDA/HEP, and in close cooperation with sector stakeholders, EnDev and CCA supported the revision of the Action Plan. This collaborative effort resulted in a draft National Action Plan for Clean Cooking 2020–2030, providing a roadmap for advancing clean cooking solutions in Bangladesh.

As a member of HEP and in collaboration with RVO, EnDev undertook the following initiatives:

01 **Capacity development of the officials and staff of HEP, including training and exposure visits**

02 **Assessment of lab testing capacity of ICS test labs**

03 **Study the potential for alternative fuels such as briquettes and pellets**

03 **Promotional activities for market development of clean alternative cooking fuels**

6 PROMOTING BRIQUETTES AS A CLEAN ALTERNATIVE COOKING FUEL

(2016 – 2022)

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The market for processed and compressed biomass such as briquettes and pellets is relatively underdeveloped in Bangladesh as compared to the neighboring countries. To explore opportunities for wider adoption, EnDev, in collaboration with the RVO, undertook several initiatives to assess the potential for large-scale use of briquettes as a clean and affordable cooking fuel in the country.

- Research on the mixture of various ingredients for use in briquettes (rice husk, saw dust, cow dung) partnering with Kheya Samaj Unnayan Sangstha, Satkhira, Dhaka University Institute of Energy and TUV SUD
- Technological assessment and innovation for briquette manufacturing, partnering with Ahsanullah University, TUV SUD
- Marketing and promotional activities to support briquette market development with Practical Action
- Market research on the potential use of fecal sludge as an ingredient in briquette production in partnership with SNV

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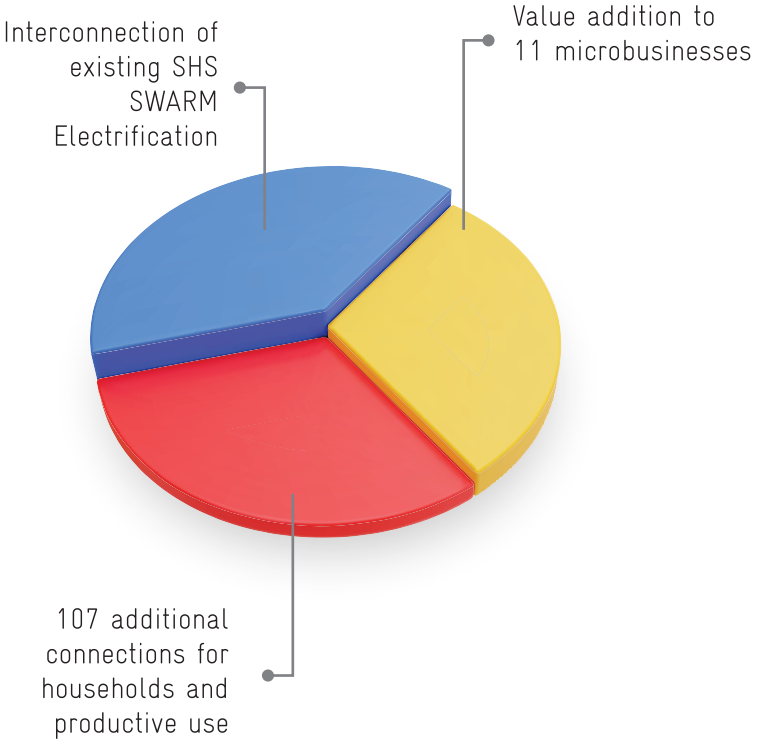
7 PILOTING SWARM ELECTRIFICATION AND SMART NANO-GRIDS

(2017 – 2018)

In partnership with a technology provider (SOLshare), EnDev supported innovative off-grid energy solutions for rural communities, including nano-grid installations and peer-to-peer energy trading through SWARM electrification. This initiative created the world's first peer-to-peer energy exchange network among rural households and small businesses using rooftop solar home systems.

Through this system, households with excess solar power can sell electricity into a shared micro-grid, while neighbouring homes or shops can purchase small amounts of power using mobile credit. This model helps maximise the use of locally generated solar energy, improves energy access, and ensures more reliable and efficient electricity supply for rural communities.



8 COVID-19 RESPONSE AND SUPPORT

(2020 – 2021)

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During the Covid-19 pandemic, many partner organisations and end-users experienced significant operational and financial challenges. To safeguard energy access, protect livelihoods, and ensure continuity of services, EnDev established a special support fund to implement targeted interventions using renewable energy and energy-efficiency solutions. These initiatives helped partner organisations restart activities, strengthened local resilience, and supported vulnerable communities.

Livelihood Support through Solar-Powered Productive Use
Partner: SNV, Netherlands Development Organisation
EnDev supported SNV to implement solar-powered livelihood activities, enabling households and micro-entrepreneurs to generate income and restart small businesses through productive use of solar energy technologies.

Revitalizing Clean Cooking Supply Chains
Partner: Bangladesh Bondhu Foundation (BBF)
Selected sanitary shops and clean cooking entrepreneurs received financial assistance to restart operations, covering promotional and business recovery costs following pandemic-related disruptions.

Solar Electrification of Rural Health Facilities
Partner: Bright Green Energy Foundation (BGEF)
A rural health complex was equipped with a solar power system, ensuring continuous electricity supply to support essential medical services during the pandemic and beyond.

Strengthening E-Mobility Solutions
Partner: Singra Municipality
Support was provided to reinforce the e-mobility initiative under the Transformative Urban Mobility Initiative (TUMI) project, improving clean transport options and enabling safer, reliable mobility services for local residents during the recovery period.



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ELECTRIC COOKING INITIATIVE

(2020 – 2025)

The draft National Action Plan for Clean Cooking 2022 – 2030 calls for increasing the percentage of households using e-cooking devices from 2% in 2020 to 10% (45 million households) in 2030. To help meet this target, EnDev has undertaken a few measures to help develop market for e-cooking devices. This includes rice cookers, induction cookers, infrared cookers and electric pressure cookers.

Field testing of grid integrated solar e-cooking devices in households and businesses in collaboration with UIU

Collaboration with Bangladesh Standard and Testing Institute (BSTI) for adoption of ISO standards for e-cooking appliances

Behavior Change Campaign in Khulna Division for raising awareness and promoting the market development of e-cooking appliances by Practical Action. Reaching 25,000 people

Market survey of e-cooking devices, including availability of different brands and models, and their prices, sales volume and trend

Dissemination of over 23,000 e-cooking appliances by Walton & ATEC with the RBF scheme for market development

10 SOLAR-POWERED E-RICKSHAW CHARGING: UNLOCKING PRIVATE INVESTMENT OPPORTUNITIES

(2021 – 2025)

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Bangladesh has experienced a rapid expansion of electric three-wheeler rickshaws, with more than 3 million currently operating primarily in peri-urban and rural areas. While e-rickshaws provide affordable mobility and livelihoods for thousands of drivers, the absence of structured charging infrastructure has led to unregulated grid connections, safety risks, and additional strain on local electricity networks.

To address these challenges and promote clean, reliable charging solutions, EnDev, in partnership with Northern Electricity Supply PLC (NESCO), piloted a solar-powered charging station in Rajshahi.

Key Features of the Pilot:

System Capacity	Charging Capacity	Impact
25 kWp Rooftop solar PV with net-metering	35–40 e-rickshaws per day	Around 27 MWh of renewable electricity supplied to the grid (as of October 2025)

The pilot demonstrated that solar integration can reduce stress on distribution networks, enhance charging security, and support greener urban transport. It also established a bankable, commercially viable business model for scaling solar-based e-mobility charging hubs.

Financial Viability:

Approximate payback: 5 years (without subsidy)	With 20–25% grant/subsidy: 2–3 years	Investor relevance: Attractive for small and medium entrepreneurs, especially those with limited upfront capital

Building on the success of the Rajshahi pilot, the model has been replicated in Betgari, Bogura, where a local entrepreneur invested using a bank loan combined with personal equity, supported by Bangladesh Bank's Sustainable Finance Fund (1-5% concessional refinancing for green initiatives).

These initiatives prove both technical feasibility and commercial viability, offering a scalable model for clean e-mobility infrastructure in Bangladesh. The approach contributes to national renewable energy targets 20% by 2030 and 30% by 2040 while advancing safe, affordable, and sustainable transport systems.

AT A GLANCE

EnDev's Impact in Bangladesh
through Various Initiatives

Around
4.2 million
people reached with
access to energy

More than
1.8 million
people reached with
access to clean
electricity

More than
2.3 million
people reached
excluding households
benefitting from clean
cooking solutions

Around
2.0 million
women reached with
access to energy

Contributed to
save over
1.98 million
million of CO_2 emission
since 2011

Supported for over
25,000
micro, small, and medium
enterprises (MSMEs)
including **970** social
institutions.

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Dag-Hammarskjöld-Weg 1–5
65760 Eschborn
Germany

T +49 61 96 79-0
F +49 61 96 79-11 15
E info@giz.de
I www.giz.de

Contact:
Shahbina Nahid Labib
shahbina.labib@giz.de

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GIZ/Md. Mesbahul Haque

Authors:
Shahbina Nahid Labib
Zunayed Ahmed
Puja Saha
Fowzia Nowsheen

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