



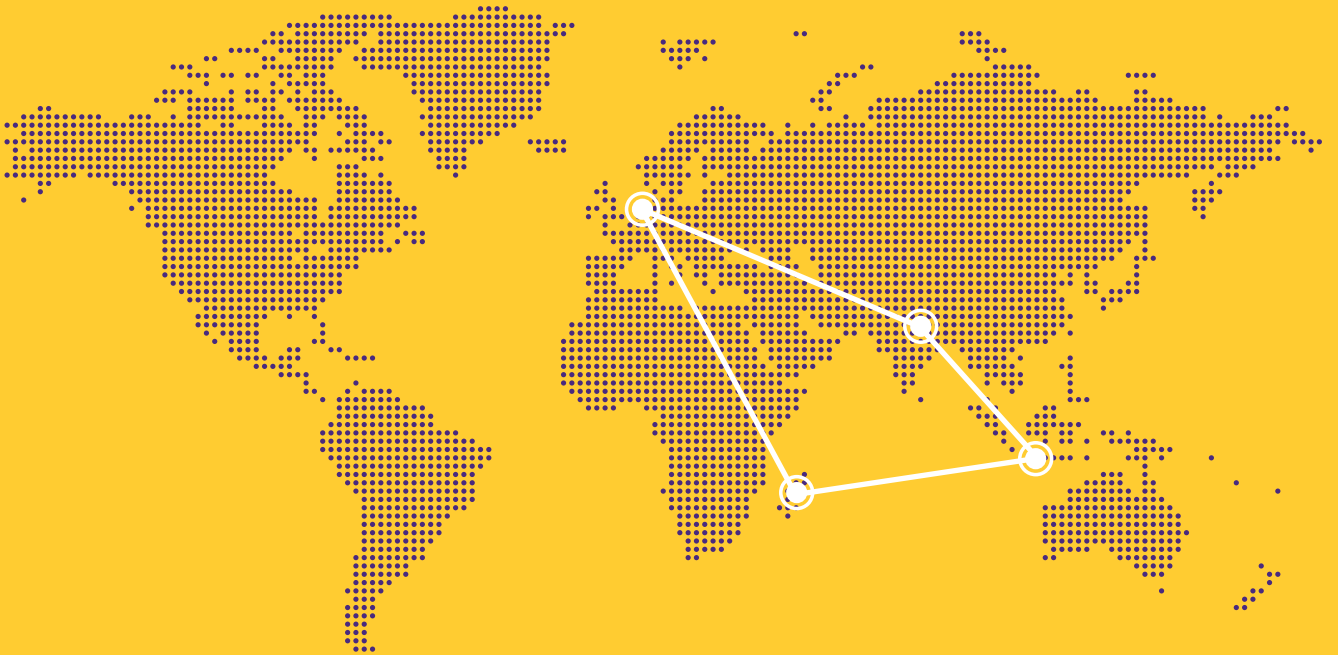
# A CONCEPT PAPER FOR GENDER MAINSTREAMING IN SOUTH-SOUTH TRIANGULAR COOPERATION

on Renewable Energy between Madagascar, Nepal,  
Indonesia and Germany (SSTC RE)



Studied and Developed within The Joint  
Indonesian-German Project on SDGs SSTC  
April 2023







# **A CONCEPT PAPER FOR GENDER MAINSTREAMING IN SOUTH-SOUTH TRIANGULAR COOPERATION**

**on Renewable Energy between Madagascar, Nepal,  
Indonesia and Germany (SSTC RE)**



## **“CONCEPT PAPER ON GENDER MAINSTREAMING IN SOUTH-SOUTH AND TRIANGULAR COOPERATION IN RENEWABLE ENERGY INDONESIA – MADAGASCAR – NEPAL – GERMANY (SSTC RE)”**

Supported by the joint Indonesian-German project on “Strengthening Capacities for Policy Planning for the Implementation of the 2030 Agenda in Indonesia and in the Global South (SDGs SSTC)”

April 2023

Developed by the Indonesian Ministry of State Secretariat and the Indonesian Ministry of Energy and Mineral Resources within the bilateral Indonesian-German Project of ‘Strengthening Capacities for Policy Planning for the Implementation of the 2030 Agenda in Indonesia and in the Global South (SDGs SSTC)’.

Copyright © Indonesian Ministry of State Secretariat

All images @gjz

April 2023, Jakarta

### **DISCLAIMER**

The designation employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Indonesian Ministry of State Secretariat and the Indonesian Ministry of Energy and Mineral Resources concerning the legal status of any country, territory, city, or area or its authorities, or concerning the delimitation of its frontiers or boundaries, or regarding its economic system or degree of development. The views expressed in this publication do not reflect the views of the Indonesian Ministry of State Secretariat, the Indonesian Ministry of Energy and Mineral Resources, or the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Mention of a commercial company or product in this publication does not imply endorsement by the Indonesian Ministry of State Secretariat, the Indonesian Ministry of Energy and Mineral Resources, or the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The use of information from this publication concerning proprietary products for publicity or advertising is not permitted. Reproduction and dissemination of material in this publication for educational or other non-commercial purposes are authorized without prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for sale or other commercial purposes, including publicity and advertising, is prohibited without the permission of the copyright holders.

### **ACKNOWLEDGEMENTS**

The Paper was commissioned by the Government of Indonesia through the Ministry of the National Development Planning/Bappenas as the Main Implementing Agency and the National Coordination Team of South-South Cooperation Indonesia, chaired by the Ministry of Foreign Affairs. The substance of this publication and its preparation are the purviews of the Indonesian Ministry of State Secretariat in coordination with the National Coordination Team of South-South Cooperation Indonesia, and the Indonesian Ministry of Energy and Mineral Resources with the support from the Government of Germany through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The Paper was prepared under the guidance of Noviyanti (Ministry of State Secretariat), Agung Pribadi (Ministry of Energy and Mineral Resources), Zulazmi and Neni Marlina (GIZ).

The Government of Indonesia funded the preparation of the paper through the Ministry of State Secretariat and the Ministry of Energy and Mineral Resources, the German Federal Government (Federal Ministry for Economic Cooperation and Development) funded the paper through the joint Indonesian-German project on “Strengthening Capacities for Policy Planning for the Implementation of the 2030 Agenda in Indonesia and in the Global South (SDGs SSTC)”.

**Author:** Gaynor Tanyang

**Contributors:** Dian Prasomya Ratri, Alfi Kurnianingsih, Arienaldi, Mulyani, Ida Ayu Primashita, Joko Tulodo, Jeska Daslita Sopaheluwakan, Nawa Raj Dhakal, Bikash Uprey, Mamisoa Rakotoarimanana, Anita Raharisoa, Minohanta Rasoalisoa, Thilo Schreiner, Catoer Wibowo, Katarzyna Rezza Vega, Brunelle Padonou, Net Pham Thi Hong, Ayaka Nagasaki, Genevieve Reverente, Neni Marlina, Vania Situmeang, and Nathaya Anandipa

**Design:** Dewi Simanjuntak





## FOREWORD

Motivated by shared interests in achieving sustainable energy, Indonesia, Nepal, Madagascar, and Germany have agreed to exchange valuable knowledge on policies, practices, challenges in renewable energy carrying the spirit of solidarity and mutual benefits within the framework of **South-South and Triangular Cooperation on Renewable Energy (SSTC RE)** starting in January 2021 in a kick off meeting. Throughout the exchanges, all participating countries focuses on three topics which are solar energy, micro-hydro power and waste-to-energy.

Through SSTC RE, it is envisioned that the implementation of renewable energy in the participating countries is strengthened through several indicators as agreed in SSTC RE Results Framework. One of the indicators is to develop a **concept paper on gender mainstreaming in the renewable energy sector**. I am pleased to learn that we all strive in achieving each indicator as planned, among others with the accomplishment of this concept paper on gender mainstreaming in SSTC RE.

Connecting three Sustainable Development Goals: #7 Affordable and Clean Energy, #5 Gender Equality and #17 Partnership for the Goals, the paper provides recommendations for SSTC RE participating countries in reducing gender inequality and increasing access to renewable energy focusing on policy enhancement, programme development, innovation promotion and multi-stakeholder cooperation.

With Indonesia's commitment to energy transition, the Ministry of Energy and Mineral Resources underlines the importance of increasing women's participation as decision makers in the institution, workers in the industries and users in the community level in the process. Through this paper, we can learn that gender equality in energy sector remains with gaps. More joint efforts and concrete actions shall be continued to reduce the gaps. It is with high hope that our achievement with this Concept Paper on Gender Mainstreaming in Renewable Energy can be materialised into concrete actions and bring a just and more inclusive energy transition.

Please allow me to extend our high appreciation to our friends from Alternative Energy Promotion Center in Nepal and *Agence de Développement de l'Electrification Rurale* in Madagascar, Ministry of State Secretariat, a member of National Coordination Team of Indonesia's South-South Cooperation as well as the Government of Germany through GIZ which have contributed to the during the development of this Concept Paper on Gender in Renewable Energy and during the journey of SSTC on Renewable Energy.

Thank you for our joint partnership!  
Jakarta, April 2023



**Agung Pribadi**

Head of Bureau Communication, Public Information Service and Cooperation  
Ministry of Energy and Mineral Resources, Republic of Indonesia



## FOREWORD

Renewable energy has become a prime interest to comprehend the rise of global energy consumption while maintaining the sustainability of the global environment.

In Nepal, Alternative Energy Promotion Centre strives to promote and develop the sector of renewable energy while paying attention to gender equality and social inclusion. To improve access to clean energy and increase productivity of the rural economy, we have worked with state and non-state actors in increasing investments in renewable energy technologies for communities and businesses. We also provide support to the local and provincial governments in integrating gender equality and social inclusion to the planning and implementation of activities related to the energy sector.

I am glad to learn that the "Concept Paper on Gender Mainstreaming for South-South and Triangular Cooperation on Renewable Energy (SSTC RE)" has been concluded. I am happy to learn that it also interlinks with the pathways to contribute to the achievement of Agenda 2030. Further, we can also learn that the paper focuses on how access to renewable energy can answer to challenges in reducing the gaps in gender and energy applying the principle of multi-stakeholder partnership.

The Concept Paper also shows that the gaps and challenges in gender equality and energy access remain in the involved countries, and more collaboration and joint efforts to reduce the gaps and challenges shall be continued. With the framework of South-South and Triangular Cooperation in Renewable Energy, the paper discusses opportunities on how participating countries can continue to remove barriers to implement gender-responsive energy transition. There is still work to be done in the renewable energy sector which calls for stronger collaboration among state and non-state actors at the local, national, regional and global level.

I look forward to continued dialogues and collaboration to support gender equality in the renewable energy sector.

Thank you.

Kathmandu, 17th April 2023

**Nawa Raj Dhakal**

Acting Executive Director, Alternative Energy Promotion Centre

# LIST OF ACRONYMS

ABR	Adolescent birth rate
ASEAN	Association of Southeast Asian Nations
GDI	Gender Development Index
GII	Gender Inequality Index
GIZ	Gesellschaft für Internationale Zusammenarbeit (English: Society for International Cooperation)
MMR	Maternal mortality rate
MSME	Micro, Small and Medium-Scale Enterprises
OECD	Organisation for Economic Co- operation and Development
PV	Photovoltaic
RE	Renewable Energy
SDG	Sustainable Development Goals
SSTC	South-South Triangular Cooperation
STEM	Science, Technology, Engineering, Mathematics
USDA	US Department of Agriculture



# TABLE OF CONTENTS

<b>1</b>	<b>Background</b>	<b>7</b>
<b>2</b>	<b>Objectives</b>	<b>8</b>
<b>3</b>	<b>Gender inequality and energy inequality: drivers for renewable energy solutions</b>	<b>8</b>
3.1	Energy as a driver of gender unequal poverty	10
3.2	Gender-dimensions of energy transition in a warming climate	13
<b>4</b>	<b>Pathways in mainstreaming gender in renewable energy solutions to achieving SDG-7 (Affordable and Clean Energy)</b>	<b>18</b>
4.1	What barriers exist for women to access affordable clean energy (SDG 7)?	18
4.2	What opportunities exist for women to access affordable clean energy (SDG 7) in SSTC-RE cooperating countries?	20
	In Governance	20
	Cost Effectiveness of Renewables	26
4.3	What can SSTC partners do to reduce gender inequality while promoting renewable energy?	27
	<b>References</b>	<b>36</b>



# 1 | BACKGROUND



To strengthen collaboration and learning exchange among Global South countries, towards meeting the Sustainable Development Goals (SDGs) on affordable and clean energy (Goal 7) through partnerships (Goal 17), the Governments of Indonesia, Afghanistan, Madagascar, Nepal, and Germany, are jointly implementing an initiative on South-South Triangular Cooperation on Renewable Energy (SSTC RE). During its implementation SSTC RE, which is initiated by Indonesia, is within the umbrella of the joint Indonesian-German project on *“Strengthening Capacities for Policy Planning for the Implementation of the 2030 Agenda in Indonesia and in the Global South (SDGs-SSTC)”*. SSTC RE was started in 2021 through a meeting that included sharing of best practices, successes and challenges for the achievement of SDG-7, leading towards the launching of the Concept of Cooperation of SSTC Renewable Energy (RE) in March 2021.

In June 2021, SSTC RE initiative conducted its first steering committee meeting where it was agreed by cooperating parties to adopt key documents such as the Steering Structure, Framework and Results Model. The agreed topics within SSTC RE are Central/ Centralized Solar PV Power, Micro Hydro Power Plan and Waste to Energy.

The SSTC RE aims to strengthen the implementation of renewable energy in SSTC cooperating countries, with the following specific results:

- » RE learning model, networks and coordination among the involved countries are exercised and strengthened
- » Gender on RE is deepened in the context among the involved countries (Afghanistan, Indonesia, Nepal, Madagascar, and Germany)
- » A partnership model on SSTC with multi beneficiary countries is exercised
- » Strengthening the capacity of the participating organizations through digital and distance learning

In connection with the cooperating structure, Indonesia serves as lead, with the Indonesian Ministry of Energy and Mineral Resources (MEMR) as the key implementing institution in coordination with the National Coordination Team for South-South Cooperation (NCT SSC) which consists of the Indonesian Ministries of Foreign Affairs, National Development Planning (Bappenas), Finance and State Secretariate. The NCT SSC, which is chaired by Ministry of Foreign Affairs, performs as the national focal point of contact in delivering SSTC, in coordinating south-south/triangular cooperation programs from technical line ministries, connecting and formulating cooperation with the development partners as well as in monitoring and evaluating the implementation of SSTC program. During its planning and implementation, SSTC RE has been shepherded by the Indonesian Ministry of State Secretariate as a representative from NCT SSC. In the beginning of this cooperation project, Afghanistan was included as one of the cooperating partners. After the Taliban take-over of the government in 2021, the SSTC proceeded with the exception of Afghanistan.



## 2 | OBJECTIVES

One of the key output indicators as agreed during SSTC RE First Steering Meeting in 2021 is a concept paper on implementing gender mainstreaming in achieving SDG-7, to take into account women's specific experience in accessing electricity and participating in the overall renewable energy sector. A stocktaking paper was developed in 2022 to map the existing policies, initiatives and opportunities in mainstreaming gender in the renewable energy sector in SSTC-RE participating countries.

The next step is to produce the concept paper on mainstreaming gender in renewable energy in Madagascar, Nepal, Indonesia and Germany, which fulfils Indicator 3 of SSTC RE Results Framework.=

**The aim in developing the Concept Paper on gender mainstreaming in SSTC on Renewable Energy is to facilitate dialogue and learning exchange to identify strategic actions that will address gender gaps in access to renewable energy in the form of policy enhancement, programme development, supporting innovation, and multi-stakeholder collaboration (refer to Figure 11).**



## 3 | GENDER INEQUALITY AND ENERGY INEQUALITY: DRIVERS FOR RENEWABLE ENERGY SOLUTIONS

Before diving into the core theme of this paper, it is important to provide an overview of energy access gaps in the four countries and the gender equality situation as a backdrop for underscoring why expanding access to renewable energy is a strategic solution to simultaneously address gender inequality and uneven access to energy as part of the just transition to reduce climate risks and in achieving sustainable development.

The dimensions of gender inequality in the four cooperating countries are shown in Table 1 - in social, economic and political dimensions. Overall, women in SSTC cooperating countries are disadvantaged in development all these spheres. In terms of income, women in these four countries earn 27% less than men, on average. Women in Indonesia earn 47% less than men while it is 10% in Nepal.

TABLE 1. OVERVIEW OF GENDER INEQUALITY IN SSTC-RE COOPERATING COUNTRIES

DIMENSIONS	GLOBAL TRENDS	INDONESIA	MADAGASCAR	NEPAL	GERMANY
<b>Gender Development Index (GDI) [a]</b>	Gender Gap: -0.032 GDI (World): 0.958 GDI (Developing Countries): 0.937	Gender Gap: -0.043 GDI: 0.941 GDI Rank: 114 GDI Group: 3 GDI change: 0.000 (2021)	Gender Gap: -0.036 GDI: 0.956 GDI Rank: 173 GDI Group: 2 GDI change: +0.001 (2020)	Gender Gap: -0.036 GDI: 0.942 GDI Rank: 143 GDI Group: 3 GDI change: +0.001 (2020)	Gender Gap: -0.021 GDI: 0.978 GDI Rank: 9 GDI Group: 1 GDI change: +0.001 (2020)
<b>Life Expectancy</b>	F: 74.0 +5.1 years M: 68.9	F: 69.7 +4.2 years M: 65.5	F: 66.9 +4.6 years M: 62.2	F: 70.4 +3.8 years M: 66.6	F: 83.2 +5.1 years M: 78.1
<b>Mean Years of Schooling</b>	F: 8.4 -0.5 years M: 8.9	F: 8.2 -0.7 years M: 8.9	F: 10.2 +0.1 years M: 10.1	F: 4.2 -2.1 years M: 6.2	F: 13.8 -0.5 years M: 14.3
<b>Gross National Income Per Capita</b>	F: 12,241 -8,969 M: 21,210	F: 7,906 -7,070 M: 14,976	F: 1,284 -399 M: 1,682	F: 3,677 -418 M: 4,095	F: 46,150 -16,993 M: 63,143
<b>Global Inequality Index (GII) [b]</b>	GII: 0.465 GII Rank: (NA)	GII: 0.444 GII Rank: 110	GII: 0.556 GII Rank: 143	GII: 0.452 GII Rank: 133	GII: 0.073 GII Rank: 19
<b>Reproductive Rights [b], [c]</b>	MMR: 225.4 ABR: 42.5	MMR: 177 ABR: 33.9	MMR: 335 ABR: 119.4	MMR: 186 ABR: 63.8	MMR: 7 ABR: 7.5
<b>Leadership [b]</b>	F: 25.9%	F: 21.0%	F: 17.2%	F: 33.6%	F: 34.8%
<b>Education [b]</b>	F: 64.2% -6.2 M: 71.7%	F: 51.0% -7.2 M: 58.2%	F: 27.3% -2.5 M: 29.8%	F: 28.8% -15.9 M: 44.7%	F: 96.1% -0.4 M: 96.5%
<b>Labour Force Participation Rate [b], [d]</b>	F: 46.2% -25.5 M: 71.7%	F: 53.7% -38.0 M: 81.7%	F: 81.5% -6.1 M: 87.6%	F: 78.7% -2.1 M: 80.8%	F: 56.8% -9.2 M: 66.0%
Women's employment is largely informal and lower wages than men; most are in agriculture and rural employment and in traditional gendered positions					

[a] Gender gap (2021 data); GDI Rank of 1 is highest or closer to gender equality (out of 191 countries); GDI Group 1 means higher equality/low gender disparity, Group 5 means low equality/high gender disparity; GDI change shows reference year in parenthesis; Life expectancy, Mean Years of Schooling and Gross National Income Per Capita are derived from the same source; Source: UNDP, 2022a.

[b] Source: UNDP, 2022a. Items marked in red are below global average. Leadership is measured by share seats in parliament. Items marked in red is below 40%. For Labour Force Participation, items marked in red means higher gender disparity from global average.

[c] MMR – Maternal Mortality Rate (deaths per 100,000 live births); ABR – Adolescent Birth Rate (births per 1,000 women ages 15–19); items in red are higher than global average.

[d] Source: SSTC-RE Stocktaking Paper on Gender Mainstreaming in Renewable Energy, 2022f.

### 3.1 ENERGY AS A DRIVER OF GENDER UNEQUAL POVERTY

Women are not only behind in development compared to men; they also experience poverty more severely than men. Across the three countries, there are 34.5 million people experiencing multidimensional poverty – which is the measure of acute deprivations in health, education, and living standards that a person faces simultaneously (OPHI, 2022). It measures key development indicators in health (nutrition and child mortality), education (years in schooling and school attendance), and standard of living (deprivations in cooking fuel, sanitation, drinking water, electricity, housing and assets). Among the three countries, Madagascar has the largest proportion of people who are multidimensionally poor at 67.4% at 18.1 million. The poor in Nepal is at 17.7% at 5.1 million and Indonesia, 3.6% at 9.5 million.

In Indonesia, 11% of households are female-headed and they are twice likely to be poorer than men. In Madagascar and Nepal, female-headed households comprise 18% and 23% of the population, respectively. In these countries, female headed households fare slightly better male-headed households. However, there will be more female-headed households in severe poverty.

For female headed-households, the key poverty drivers are deprivations in cooking fuel, sanitation, housing and assets; while for male-headed households, it is cooking fuel, sanitation, housing and drinking water.

TABLE 2 POPULATION IN MULTIDIMENSIONAL POVERTY BY HEAD OF HOUSEHOLDS

		INDONESIA		MADAGASCAR		NEPAL	
population multidimensionally poor		9.8 million		19.5 million		5.1 million	
		female-headed	male-headed	female-headed	male-headed	female-headed	male-headed
population in multidimensional poverty (%)		6.1	3.3	68.1	69.3	16.8	17.7
population in severe multidimensional poverty		0.48	0.44	47.33	45.10	4.94	4.84
<b>proportion (%) of people who experience deprivations in...</b>	nutrition	..	..	25.7	34.3	15.0	19.4
	child mortality	1.4	1.5	4.6	5.5	1.2	1.8
	years of schooling	9.8	3.4	51.4	49.6	20.2	17.2
	cooking fuel	24.7	22.1	99.1	99.0	47.2	59.6
	sanitation	20.0	18.9	95.2	93.6	25.9	20.1
	drinking water	13.3	14.0	58.7	63.0	6.8	6.5
	electricity	3.0	2.6	68.3	62.3	7.8	10.8
	housing	10.9	10.3	74.5	74.4	48.6	58.2
	assets	12.9	5.0	65.2	51.4	26.0	18.6
<b>headcount of people who experience deprivations in... (in million)</b>	nutrition	..	..	25.7	34.3	15.0	19.4
	who experience	1.4	1.5	4.6	5.5	1.2	1.8
	deprivations in...	9.8	3.4	51.4	49.6	20.2	17.2
	cooking fuel	24.7	22.1	99.1	99.0	47.2	59.6
	(in million)	20.0	18.9	95.2	93.6	25.9	20.1
	drinking water	13.3	14.0	58.7	63.0	6.8	6.5
	electricity	3.0	2.6	68.3	62.3	7.8	10.8
	housing	10.9	10.3	74.5	74.4	48.6	58.2
	assets	12.9	5.0	65.2	51.4	26.0	18.6

Items highlighted shows the top-3 deprivations by proportion of population.

Source: OPHI, 2022

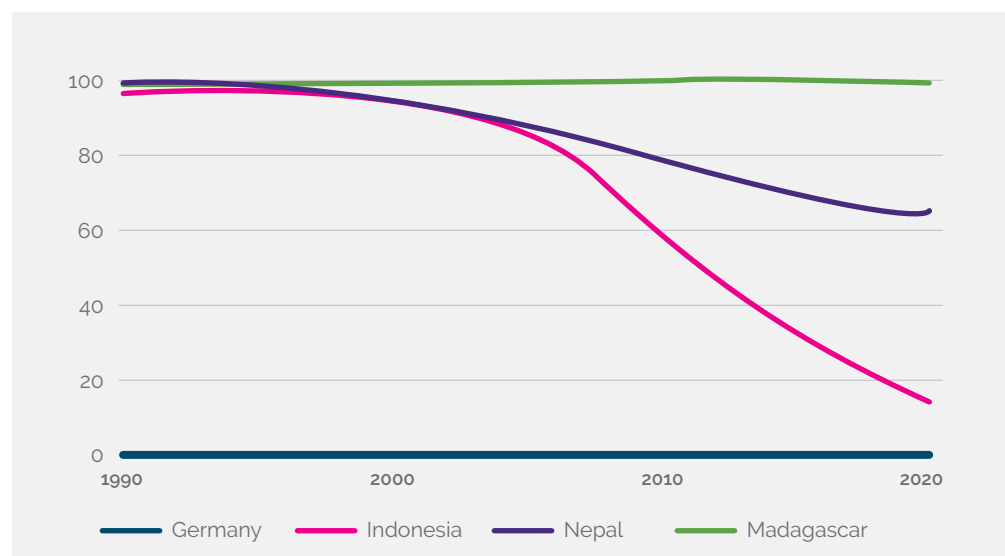
The lack of access to energy affects women because of their care responsibilities in the home and inadequacy of essential services (such as water, health, sanitation). The lack of affordable energy also affects women’s educational status, participation in livelihood and employment, and vulnerability to gender-based violence.

**In the home**, women are responsible for food preparation and cooking as well as other care responsibilities, such as laundry, cleaning the house, taking care of children, elderly and family members who are ill. To perform these roles, women will need fuel for cooking, electricity to run appliances (such as refrigerator, cooling or heating systems) as well as to run motorized water pumps, among some examples. A community without adequate supply of electricity will likely not have enough water, sanitation, or health service available. This will eventually lead to women’s increased time needed to collect water, firewood and fuel.

A study in the US showed that women spend 1-2 hours (even more) each day preparing, cooking, and cleaning up from meals for a household size of 2.6 (Monsivias, et.al). This study concluded that “time spent cooking at home is a prerequisite to achieving healthier food consumption patterns. Even the USDA’s Thrifty Food Plan (characterized by a healthy diet plan at the lowest cost) heavily relies on cooking at home, implying that home cooking is important for achieving higher diet quality at lower costs.” Therefore, achieving good nutrition is very closely related to ability to prepare food at home, which requires access to fuel for cooking.

Besides the weight of the work on women, the **gap in access to clean fuel** – SDG 7 – is still a cause for concern. In Indonesia, Madagascar, and Nepal, this gap is 15.5%, 99%, and 65.2%, respectively. What is considered “clean” is according to WHO Guidelines on indoor air quality. The fuels and technologies that are considered clean include electricity, natural gas, liquified petroleum gas, biogas, ethanol, and solar. The use of solid fuels and kerosene in the home is associated with increased mortality from acute lower respiratory, chronic obstructive pulmonary disease, stroke, ischaemic heart disease, and lung cancer (OWID, 2022).

FIGURE 1 SDG 7: GAP IN ACCESS TO CLEAN FUELS 1990-2021 (AS A PERCENT OF THE POPULATION)



Data source: Our World in Data using WHO data, 2022

In Table 3, the magnitude of persons deprived of cooking fuel and electricity is shown in terms of the disparity between female and male-headed households. The proportion of women-headed households deprived of access cooking fuel and electricity is higher than male-headed households. However, the absolute headcount of people deprived of cooking fuel and electricity in multidimensional poverty is also an important image to consider. In the three countries, 105 million people are deprived of cooking fuel and 28 million lacking electricity. Observe as well that as there are less female headed households than male-headed, the magnitude of the deprivation becomes more stark as a gender issue since women are primary users of cooking fuel.

TABLE 3. MAGNITUDE OF DEPRIVATION IN COOKING FUEL AND ELECTRICITY BY HOUSEHOLD HEAD (IN THOUSANDS)

	INDONESIA		MADAGASCAR		NEPAL		TOTAL	
	female-headed	male-headed	female-headed	male-headed	female-headed	male-headed	female-headed	male-headed
population	in millions		in millions		in millions		in millions	
in multidimensional poverty (%)	1,813	8,019	3,465	16,033	1,112	4,024	0	0
in severe multidimensional poverty (%)	142	1,066	2,409	10,434	328	1,099	0	0
nutrition	..	..	1.31	7.93	1.00	4.41	2.31	12.34
child mortality	0.42	3.56	0.24	1.27	0.08	0.42	0.73	5.25
years of schooling	2.91	8.29	2.62	11.48	1.34	3.91	6.87	23.68
cooking fuel	7.30	53.49	5.04	22.91	3.13	13.53	15.48	89.94
sanitation	5.93	45.77	4.84	21.65	1.72	4.56	12.49	71.98
drinking water	3.94	33.89	2.99	14.58	0.45	1.47	7.38	49.94
electricity	0.88	6.32	3.48	14.40	0.52	2.46	4.87	23.19
housing	3.21	24.91	3.79	17.20	3.23	13.21	10.23	55.32
assets	3.80	12.14	3.32	11.90	1.73	4.23	8.84	28.27

Items highlighted shows the top-3 deprivations by headcount

Data source: OPHI, 2022

Traditional norms, gender stereotypes and other exclusionary practices on the basis of gender and other social factors, can also create barriers to women's access to clean energy. In addition, lack of sufficient awareness and knowledge of benefits of using clean energy technologies also impede women's access to clean energy.

Women face greater risks of gender-based violence while collecting water, firewood and in the absence of safe sanitation facilities. The overall culture of male domination in the home and all aspects of society perpetrates the culture of violence against women, girls and boys (Stocktaking Paper).

In addition, large-scale infrastructure development for energy, water and other development creates an influx of male workers that increases the demand and therefore vulnerability of women and girls to sex work and prostitution, to respond to this new "service" demand; women are also induced to taking on similar vulnerable "paid" work within the community or as migrant workers (Stocktaking Paper).

Energy poverty has serious health, education, and other socio-economic impacts for people in a country. "Energy poverty is a worldwide phenomenon, although it is most intense in developing countries and especially affects women, who are the main users and producers of household energy. In some OECD countries, it is estimated that up to 30% of households live in energy poverty, limiting women's and girls' access to education and economic opportunities, and disproportionately exposing them to health risks (OECD, 2022)."

Therefore, energy transition to renewables in these cooperating countries should focus on providing clean energy to democratize access to cooking fuel, sanitation, drinking water, while also looking at energy efficient housing targeting the poorest segments of the population. Renewable energy provides an opportunity to enhance access to energy (MDG Goal 7) through just transition from fossil fuel to clean energy.

Each country's associated targets to achieve a reduction in GHG emissions and to build a climate-neutral future based on their NDCs and the stated gender-specific targets are summarized in Table 5.

### 3.2 GENDER-DIMENSIONS OF ENERGY TRANSITION IN A WARMING CLIMATE

Among the four countries, Indonesia contributes the most greenhouse gases (GHG), followed by Germany, as shown in Figure 2. Together, the four countries contribute an annual average GHG emissions at 2,428 MtCO<sub>2e</sub>. However, Germany ranks highest in GHG emissions per capita (Figure 3). Between 1990 and 2019, Germany and Madagascar's GHG emission have decreased by 20% and 17%, respectively, while Indonesia and Nepal's emissions increased by 36% and 65%, respectively.

Fossil fuel continues to be the main energy source in Germany and Indonesia, with increasing share of renewables being seen, as shown in Figure 3. On the other hand, the share of RE in total final energy consumption is between 80% to 90% in Madagascar and Nepal (refer to Figure 4). Nepal's electricity is almost fully generated using RE sources, while half of Madagascar's electricity is sourced from RE (Figure 5). This shows that Madagascar and Nepal could stay in momentum to expand the use of RE in increasing coverage of electricity and increased access to energy to its population. The geography of these two countries could explain why RE has a significant share in their energy mix and should provide a solid rationale for continuing on the track to invest in more RE solutions.



FIGURE 2 GREENHOUSE GAS EMISSIONS PER COUNTRY 1990-2019 (IN MTCO<sub>2</sub>E)

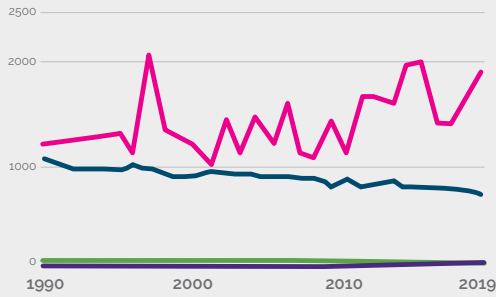


FIGURE 3 GREENHOUSE GAS EMISSIONS PER CAPITA 1990-2019 (IN TCO<sub>2</sub>E PER CAPITA)

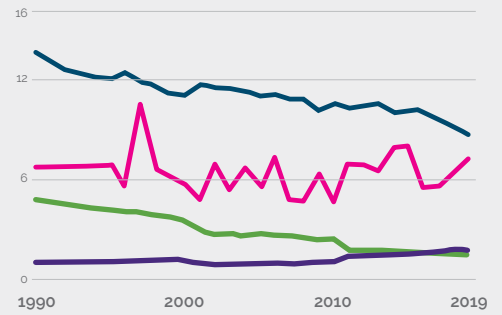


FIGURE 4 SHARE OF FOSSIL FUEL AND RENEWABLES AS ENERGY SOURCE 2001-2021 (IN PERCENT)

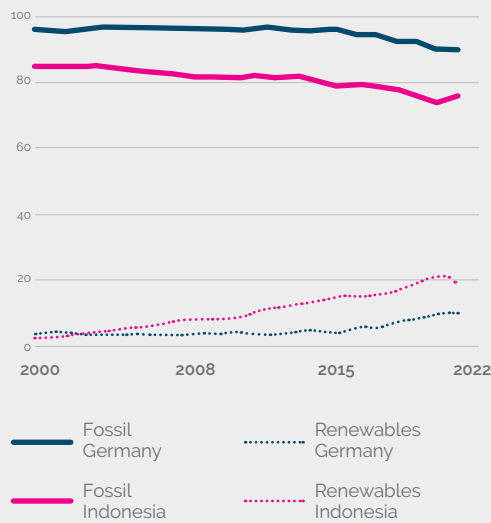


FIGURE 5 SHARE OF RE IN FINAL TOTAL ENERGY CONSUMPTION 2012-2019 (IN PERCENT)

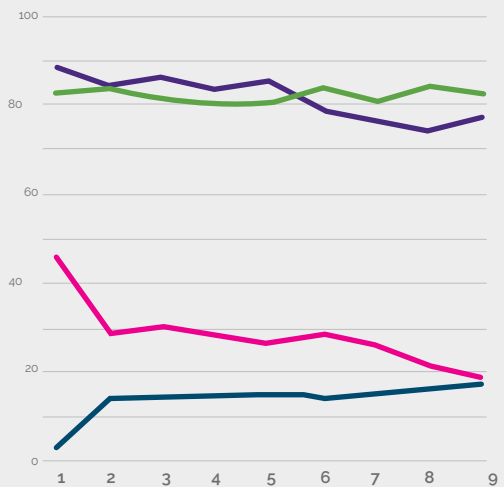
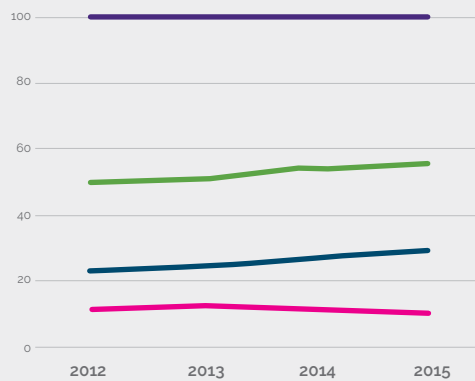


FIGURE 6 RENEWABLE ELECTRICITY OUTPUT 2012-2015 (IN PERCENT)



- Germany
- Indonesia
- Nepal
- Madagascar

The targets identified in the National Determined Contributions of the four cooperating countries are summarised in Table 4. Except for Nepal, all the countries are targeting to increase the share of clean energy by at least 31%. The 20-year greenhouse gas emissions (GHG) of the countries are also shown in Figure 2. Over the past two decades, Germany's GHG is decreasing until 2020 while Indonesia's continue to increase. Madagascar and Nepal's emissions are very low.

TABLE 4 NDC TARGETS

COUNTRY	INDONESIA	MADAGASCAR	NEPAL	GERMANY
Commitment	GHG reduction	GHG reduction	Non-GHG	GHG reduction
NDC submission	Updated NDC1	NDC1	NDC2	Updated NDC1
GHG emission reduction target by 2030	31.89% 43.20% (c)	30% (c) 30 MtCO <sub>2</sub>	None mentioned	38%
Net-Zero target year	2060	None mentioned	2050	2050
Clean energy targets	Energy mix by 2050: NRE >31% Oil <20% Coal <25% Gas >24%	Reinforce RE (hydro and solar) from 35% to 79% (year not specified)	By 2030, ensure 15% of the total energy demand is supplied from clean energy sources	Final RE consumption should be least 32% by 2030

Legend: NDC1 refers to First Nationally Determined Contribution; NDC2 refers to Second Nationally Determined Contribution; (c) indicates conditional targets; NRE refers to "new and renewable energy"

It is important to look at whether these targets consider the differential impacts of the energy transition on men and women. All the countries, except Madagascar, have explicitly mentioned the following areas in mainstreaming gender in their approach to reducing GHG emissions: sex-disaggregated data generation, gender analysis, women's leadership and public participation, natural resource tenurial security, climate-smart agricultural technologies, financing, and policy development. These are provided in more detail in Table 5.

TABLE 5 NDC TARGETS AND GENDER MAINSTREAMING

COUNTRY	CLIMATE POLICIES, PROGRAMMES AND GOALS	GENDER-SPECIFIC TARGETS*
<b>Indonesia</b>	<ul style="list-style-type: none"> <li>» REDD+ strategies for peat lands restoration and rehabilitation of degraded land</li> <li>» National Energy Policy and National Energy Grand Plan on transforming the country's energy mix</li> <li>» Electricity Supply Business Plan prioritizing NRE development</li> <li>» National mandatory biodiesel policy of B20 and development of green refineries and green fuels</li> </ul>	<p>Mapping gender issues in climate change in all development sectors</p> <p>Enhancing role of women in development and strengthening women's capacity and leadership in climate change</p>

COUNTRY	CLIMATE POLICIES, PROGRAMMES AND GOALS	GENDER-SPECIFIC TARGETS*
	<ul style="list-style-type: none"> <li>» Acceleration of the Battery Electric Vehicle Program for Road Transportation</li> <li>» Acceleration of Construction of Thermal Generation Facilities for Converting Waste into Electricity Energy with Environmental Sound Technology</li> <li>» Climate Village Programme (ProKlim)</li> <li>» Climate literacy, risks management, and disaster preparedness</li> </ul>	
<b>Madagascar</b>	<ul style="list-style-type: none"> <li>» Improve energy efficiency</li> <li>» Rural electrification</li> <li>» Disseminate improved stoves (by 2030: 50% of households adopting improved stoves)</li> <li>» Large scale dissemination of intensive/ improved rice farming techniques</li> <li>» Large scale implementation of conservation agriculture and climate-smart agriculture</li> <li>» REDD+</li> <li>» Biogas production from waste water</li> <li>» Sustainable management (compost) of organic household waste (50% of waste treated in urban agglomerations)</li> </ul>	None explicitly stated
<b>Nepal</b>	<ul style="list-style-type: none"> <li>» 15%; of which 5-10 % will be generated from mini and micro-hydro power, solar, wind and bioenergy</li> <li>» By 2030, increase sales of e-vehicles to cover 90% of all private passenger vehicle sales</li> <li>» By 2030, develop 200 km of the electric rail network for mass transportation</li> <li>» By 2030, ensure 25% of households use electric stoves as their primary mode of cooking</li> <li>» By 2025, install an additional 200,000 household biogas plants and 500 large scale biogas plants (institutional/ industrial/ municipal/community)</li> <li>» Expand clean energy generation to REDD+</li> </ul>	<ul style="list-style-type: none"> <li>» Community-based forestry management committees will have 50% women representation and proportional representation of Dalits and Indigenous People in key posts; ensure their fair and equitable benefits</li> <li>» Institutional mechanisms and structures in place and adequate provision of budget to ensure social and environmental safeguards</li> </ul>

COUNTRY	CLIMATE POLICIES, PROGRAMMES AND GOALS	GENDER-SPECIFIC TARGETS*
	<ul style="list-style-type: none"> <li>» By 2025, 380 million litres/day of wastewater will be treated before being discharged, and 60,000 cubic meters/year of faecal sludge will be managed</li> <li>» Other targets aimed at the tourism, urban settlement sectors</li> </ul>	<ul style="list-style-type: none"> <li>» Forest tenure and access to finance and technology for communities, women and Indigenous People.</li> <li>» Ensure increased access of climate-smart agricultural technologies to women, Indigenous People, smallholder farmers and marginalized groups</li> <li>» By 2030, develop an Action Plan for integrating Gender Equality and Social Inclusion in achieving NDC targets targeting increased women and vulnerable group's leadership capacity development and the generation and reporting of sex-disaggregated data</li> </ul>
<b>Germany</b>	<ul style="list-style-type: none"> <li>» Reduce emissions from aviation</li> <li>» EU regulation on greenhouse gas emissions and removals from Land Use, Land-Use Change and Forestry</li> <li>» Improving energy efficiency and for increasing renewables in the EU energy mix</li> <li>» Reduce CO2 emissions from road transport</li> <li>» Increasing the circularity of the EU economy</li> <li>» European Green Deal</li> </ul>	EU NDC is prepared in the context of the EU's commitment to gender equality and cross-cutting priorities including the European Pact on Gender Equality

Source: \*NDC submissions, \*\*Gender in RE Stocktaking Paper



## 4 | PATHWAYS IN MAINSTREAMING GENDER IN RENEWABLE ENERGY SOLUTIONS TO ACHIEVING SDG-7 (AFFORDABLE AND CLEAN ENERGY)

This concept is largely based on the Stocktaking Paper in Renewable Energy produced in 2022 under the SSTC-RE project. This concept paper is thus a supplement to the stocktaking paper, with additional data and resources that can serve as basis for the recommendations put forward in this document.

### 4.1 WHAT BARRIERS EXIST FOR WOMEN TO ACCESS AFFORDABLE CLEAN ENERGY (SDG 7)?

As we have seen, energy poverty deepens and widens' gender inequality, preventing women to free up time and human energy to pursue education, or take on new livelihood activities or employment.

The male-dominated energy industry is a key barrier to understanding the gendered dimension of energy access. Education in technical areas and sciences or STEM generally remains sex-dichotomized reinforcing traditional and unequal gender roles in this sector. The promotion of renewable energy at lower capitalization provides an opportunity for women to take on new management and leadership roles at the community level (Stocktaking Paper). This requires parallel strategic change in decision-making in the energy sector to provide an enabling environment for women to exercise leadership in the industry.

Although generally, there is lack of gender-disaggregated data and analysis on linkages between gender and energy, the few available do not translate to substantive policy change and development interventions or programmes that create practical and strategic change in women's access to energy. While NDCs mention some of the gender dimensions of emission reduction targets, these still need to be translated into better targeted gender-specific goals in national and local climate mitigation and adaptation plans (refer to Table 5). There appears to be a dichotomy between gender inequality concerns (and gender mainstreaming strategies) from energy development priorities.

There is a preference for large-scale energy and water utility projects that require huge capitalization, borrowing, and high maintenance costs, that is also destructive to the already degraded natural resources.

Meanwhile, financing for projects remains far below the investment needed to achieve SDG7 by 2030. According to Sustainable Energy for All, USD 41 million will be required annually to achieve universal residential electrification. But investments going to high-impact countries are a mere only one third, or USD 16 billion, in 2018. Even more concerning is that investments in fossil fuel is increasing.

"Investment in fossil fuel generated electricity has increased, locking countries into decades of carbon emissions, import dependency and stranded asset risk. Fossil fuels accounted for the largest portion of electricity finance commitments to HICs for the first time in at least six years, driven largely by grid-connected fossil fuel projects

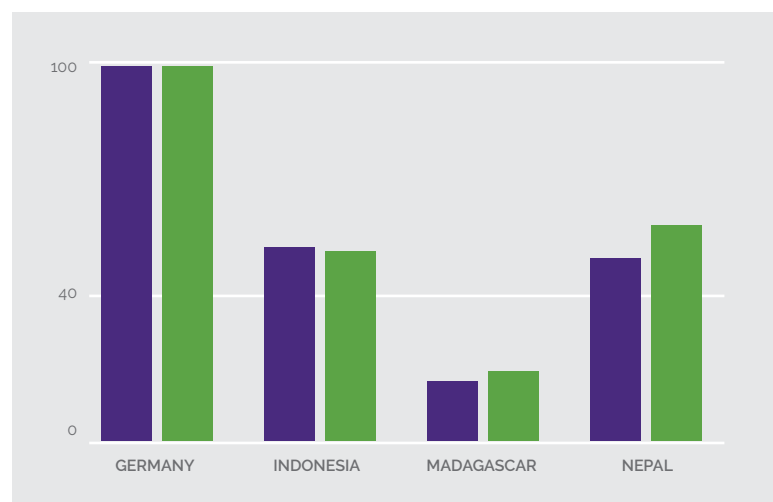
in Bangladesh. Meanwhile, financing for grid-connected renewables declined for the first time since 2013. Also, finance for minigrids and off-grid solutions remained at less than 1-1.5 percent of the total finance tracked for electricity. This limited volume of investment is unacceptable in light of the collateral damage: issues of gender equality, economic opportunity, climate change, and protection of land and forests are all suffering from this inertia" (Sustainable Energy for All, 2020, p. 9).

Women's access to financing institutions also remains very low compared to men (Stocktaking Paper). Figure 8 presents data on percentage of respondents who report having an account (by themselves or together with someone else) at a bank or another type of financial or report personally using a mobile money service in the past year. Part of the energy transition is to reduce or eliminate barriers to women's and the poor's access to financing, such as ease of application process and ringfencing funding for gender-responsive or women-target solutions.

Existing financial inclusion and renewable energy research has generally identified several main barriers that women-led micro, small, and medium enterprises confront when accessing financial services, including (1) legal, regulatory, and policy barriers, such as documentation or lack of collateral, (2) limited availability of financing due to misperceptions of viability/bankability, (3) inappropriate or generic financial products that do not suit WMSME needs, and (4) cultural or technological barriers faced by women customers. This is often coupled with an incomplete understanding of the unit economics of the RE technologies women are selling or distributing. In aggregate, these challenges impact WMSMEs' demand for traditional types of credit, suggesting that financing efforts need to be customized based on in-depth WMSME and subsector research.

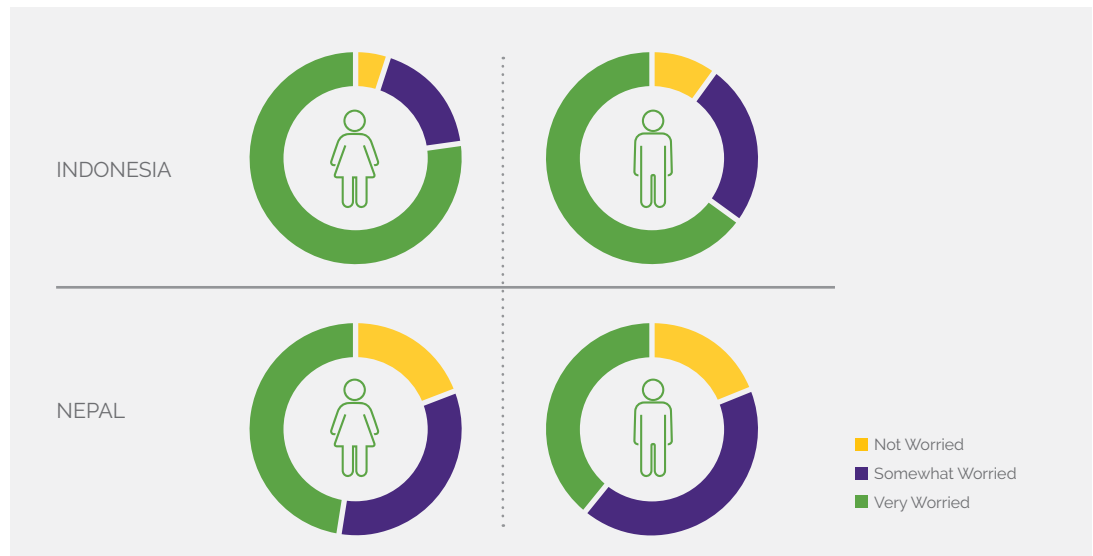
Increasing frequency, severity and coverage of climate-related disasters also disproportionately affects women, when utility services (electricity, water and communication facilities) are disrupted. The COVID-19 pandemic has brought to the fore the importance of closing the energy gap. A World Bank study (2021) shows that more women feel "very worried" more than men about the financial hardship brought about by COVID-19; while there are more men than women who express about being "somewhat worried" of the same.

FIGURE 7 ACCESS TO FINANCIAL INSTITUTION BY SEX2021 (AS A PERCENT OF RESPONDENTS)



Source: Global Findex Database 2021

FIGURE 8 MEN AND WOMEN WHO EXPERIENCE OR CONTINUE TO EXPERIENCE SEVERE FINANCIAL HARDSHIP BECAUSE OF THE DISRUPTION CAUSED BY COVID-19 2021 (AS A PERCENT OF RESPONDENTS)



Source: Global Findex Database 2021

## 4.2 WHAT OPPORTUNITIES EXIST FOR WOMEN TO ACCESS AFFORDABLE CLEAN ENERGY (SDG 7) IN SSTC-RE COOPERATING COUNTRIES?

### In Governance

Policies that translate women's equality rights into gender mainstreaming targets exist in the four cooperating countries, although at various degrees of translation into executable plans and some policies are outdated (pre-SDG and Paris Agreement). The SDG 7 targets can provide the momentum to update and execute gender-responsive energy transition.

#### EXCERPT

##### European Pact for Gender Equality (2011-2020)

In March 2011, a new European Pact for Gender Equality (2011-2020) was adopted, aimed at encouraging the EU and Member States to take measures to:

- » eliminate gender stereotypes, ensure equal pay for equal work and promote the equal participation of women in decision-making;
- » improve the supply of affordable and high-quality childcare services, and promote flexible working arrangements;
- » strengthen the prevention of violence against women and the protection of victims, and focus on the role of men and boys in order to eradicate violence.

It also reaffirms the importance of integrating the gender perspective into all policies, including external actions of the EU.

Models or examples of gender-aware energy policies among cooperating countries and elsewhere can be used as basis for enhancing national energy development strategies and climate change mitigation and adaptation plans.

## EXCERPT

### Gender and Energy Compact

The Gender and Energy Compact is a global, multi-stakeholder coalition led by ENERGIA, GWNET and UNIDO that joins forces to catalyze action towards gender equality and women's empowerment to accelerate a just, inclusive and sustainable energy transition, under the following goals:

Goal 1 Women have equal opportunity to lead, participate in and benefit from a just, sustainable and inclusive energy transition.

Goal 2 Women have equal access to and control over sustainable energy products and services.

Outcomes and Ambitions:

COUNTRY	GENDER-SPECIFIC TARGETS*
<p><b>1:</b> Energy and time poverty, as well as drudgery of women are eliminated by increasing women's access to and control over sustainable energy products and services</p>	<p>Per year at least 10% additional projects receive funding that benefit women and reduce energy poverty through gender-responsive financing mechanisms and grants/subsidies that are aligned to the needs of women and their different realities (e.g. young women, rural women)</p> <p>By 2025, applying a gender-lens to 100% of private and public sector investment aimed at reducing energy poverty as well as developing new and innovative financing schemes, such as setting up an SDG Enabling Fund</p> <p>Increase by at least 10% per year the investment in energy efficient appliances and end-uses that directly meet women's energy demands and reduce their unpaid care work, in order to have a significant positive impact on women's practical needs, family welfare and development.</p>
<p><b>2:</b> Countries and regions (re)formulate and adopt more inclusive and gender-responsive energy access and transition pathways, strategies and policies and adopt them</p>	<p>Instigate the inclusion of a gender and social inclusion perspective in (all) new energy access and transition pathways, policies, strategies and compacts, e.g. through enhancing the effective participation of women with different race, age, and social backgrounds in local energy policy making, planning, implementation and monitoring</p> <p>Enhance the share of gender-responsive budgeting and procurement used to implement energy policies and strategies to reach 100% by 2030</p>



COUNTRY	GENDER-SPECIFIC TARGETS*
<p><b>3:</b> Women-owned and -led businesses have increased access to resources, such as finance, sustainable energy, entrepreneurial capacity and business development services.</p>	<p>The share of women entrepreneurs, women-led and women-owned businesses in the sustainable energy value chains increased by at least of 7% per year, reaches at least 50% by 2030</p> <p>At least 80% increase in the productivity of women farmers and women-owned/led businesses, as a result of productive uses of sustainable electricity and thermal energy by 2030, with an increase of at least 10% per year.</p> <p>Enhance targeted public and private investment in women-led and women-owned businesses in the sustainable energy value chain, with a fair share of investment dedicated to businesses owned or led by young women entrepreneurs, and productive use of energy activities by at least 10% per year, reaching at least 80% by 2030.</p>
<p><b>4:</b> Career entry and advancement avenues for women working on energy access and sustainable energy are created</p>	<p>This means: women enjoy decent and productive employment; workplace policies and practices support recruitment, retainment and advancement of women, as well as women are equally involved in policy- and decision-making fora and discussions. Women's leadership opportunities are increased.</p>
<p><b>5:</b> Knowledge, mechanisms, tools, and sex-disaggregated data are more available and of higher-quality.</p>	<p>Mainstream gender and sex disaggregated data collection efforts to systematically report, analyse and use sex-disaggregated data and evidence to ensure accountability of all SDG 7 actions</p> <p>Collect gender-disaggregated data, and analyze and publish knowledge products, case studies, toolkits and success stories to enhance knowledge, increase the visibility of women and improve the availability of data on the gender-energy nexus.</p> <p>Build local, national, regional and international partnerships and platforms, to elevate gender equality and women's empowerment as a priority to advance SDG 7.</p> <p>Promote dialogues that include the voices of women/gender equality organizations, by an additional 10% per year, reaching at least 80% in 2030.</p>

Financing renewable energy projects can be done either through government budget allocation, access to climate financing mechanisms, new RE financing policies for the banking sector (such as "green finance"), private-partnership mechanisms, and others.

## EXCERPT

### Bidhaa Sasa

Many renewable energy technology companies steer clear of customer research because they perceive it to be a prohibitively costly venture, but in actuality, even small companies can successfully and sustainably integrate customer research into their business model. For example, Bidhaa Sasa—a social enterprise offering last-mile finance and distribution services in Kenya and Uganda, whose customer base consists primarily of low-income women without access to land- or cash-based collateral.

Bidhaa Sasa makes a significant effort to research their customers' needs and preferences and view this research as critical to their success. They collect data on their customers and use this information to refine their product and finance offerings with the end goal of increasing the percentage of women in their customer and loan portfolios.

To meet the needs of this specific segment of women without access to collateral, Bidhaa Sasa changed their financing model to a group liability model and prioritized affordability and repayment plans. In doing so, they have helped many women within this group access solar, cooking, and agricultural technologies for the first time.

The group liability model played a key role in offering affordability and addressing the collateral restraints of their customers. Bidhaa Sasa finances assets for individual women and men, but by positioning them in groups of five, they lower the risk of non-payment and help offer growth opportunities for each group member.

Additionally, through a direct-sales and primarily woman-to-woman distribution model, Bidhaa Sasa leveraged the strong trust within women's networks and thereby reduced costs associated with marketing and customer acquisition (Sustainable Energy for All, 2020).

Growth of the RE sector can facilitate **technical skills development and professional development for women** in the energy sector, for example, the ASEAN Plan of Action on Science and Technology (2016-2025), and developing women MSMEs (refer to ASEAN Strategic Action Plan for SME Development 2016-2025) and ASEAN integration targets.

## EXCERPT

### ASEAN Plan of Action on Science, Technology and Innovation (APASTI) 2016-2025

Goal: An innovation-driven economy with a deep science, technology and innovation (STI) enculturation and a system of seeding and sustaining STI, by leveraging ICT and the resources of our talented young, women and private sectors

Thrust: Enhance mobility of scientists and researchers, people-to-people connectivity and strengthen engagement of women and youth in STI.

#### Actions

- » Establish a policy framework for exchange of scientists, researchers and students including women and youth
- » Establish scholarship, fellowship and/or attachment programmes for students, researchers and other STI personnel;
- » Intensify efforts towards standardisation of certification and accreditation in education and technical competency; and
- » Expand opportunities for women, youth and the disadvantaged group to contribute in STI through incentives and support mechanisms.

Supporting and promoting low-capital, sustainable renewable energy solutions and innovating on energy delivery that is clean and affordable and that can be locally owned and managed, including by women, will significantly contribute to achieving SDG-7 targets as well as uplift the status of women in the sector and impact gender equality situation among the SSTC-RE cooperating countries.

## EXCERPT

### Women as Solar Scholars

Since 2014, the Institute for Climate and Sustainable Cities has been implementing the Solar Scholars Training Program to educate community members, local government officials, and civil society representatives on integrating renewable energy in disaster preparedness and community emergency response.

One of its partners is the community all-women self-help group called Sulong Sulu-an, who led the building of a store that offers "ice from the sun." The Tindahanani ni Nanay (mothers' store) in Sulu-an island uses a freezer powered by solar energy in storing and preserving their products, from ice to cold-cuts from their backyard livestock.

The solar freezer is also used for medical purposes. Being an off-grid island fronting the Pacific Ocean, Sulu-an has no hospital or medical facility in the neighborhood. The freezer is also used for storing emergency vaccines and medicines for community use.

ICSC has already partnered with Sulong Sulu-an in an earlier project on solar home systems distribution under the Access to Better Energy Project. The solar freezer was the identified proceed for the Sulong Sulu-an 'solidarity fund', where they regularly collect fees from their pay-to-own solar home systems.

ICSC also led the organizational development of Sulong Sulu-an by conducting capacity building activities, such as gender sensitivity orientation, visioning, and bookkeeping coaching sessions. Sulong Sulu-an members are progressively gaining confidence, not only in leading their small enterprise but also establishing their positions as community leaders, forwarding sustainable solutions in addressing community issues in Sulu-an island. (ICSC, 2022)

Measuring gender equality targets (baseline, midline and endline) in SDG-7 implementation and strengthening gendered data collection and analysis can provide guidance on targeting gender equality changes in the energy sector.

#### **EXCERPT**

##### **Examples of Possible Indicators of an Inclusive, Just Energy Transition and its impact on the SDGs**

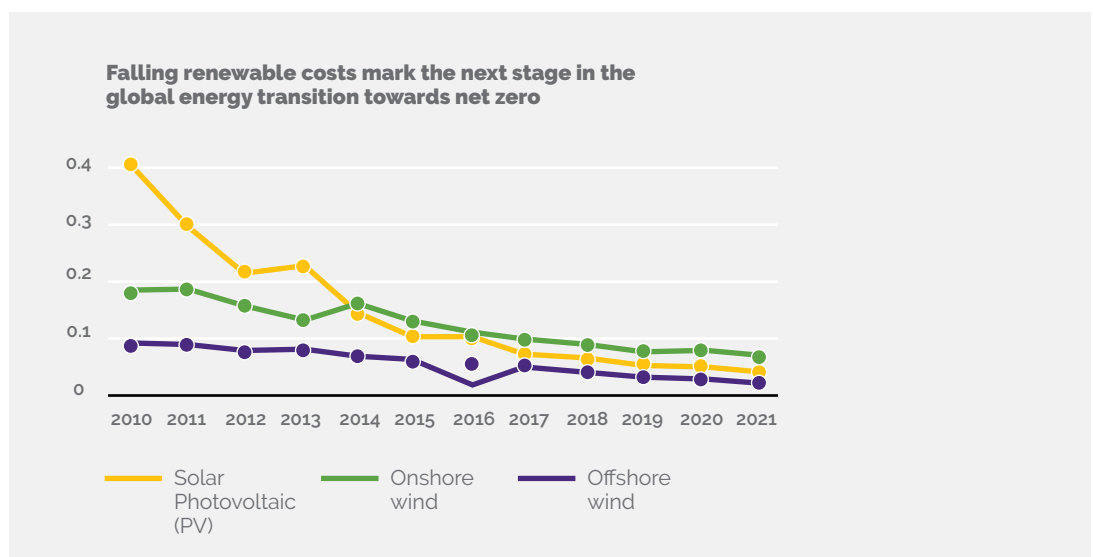
- » Percentage of low-income households spending more than or equal to 5% of their household expenditure to meet all of their energy demands (by region, gender of head of household, and indigenous populations)
- » Percentage increase in income of marginalized communities due to access to electricity for productive uses (including rural farmers, artisans)
- » Percentage of population with access to clean energy for all basic end-uses in the community (cooking, heating, lighting), disaggregated by type of settings (household, school, health care facility)
- » Number (or percentage) of students in energy-oriented educational programmes (formal and non-formal education) (by type and level of institution, gender, and geographic area)
- » Share (%) of women employed in the energy value chain for technical jobs related to renewable energy, energy efficiency, and energy access
- » Share (%) of women in senior positions in relevant ministries, national energy agencies, and programmes

- » Percentage of improved sanitation facilities powered by electricity (by electricity source, gender, geographic location)
- » Percentage increase of population with access to quality water services due to increase in access to electricity (by electricity source, geographic location, gender)
- » Percentage of fossil fuel-sector employees reskilled for employment in sustainable energy (disaggregated by gender)
- » Increase (%) in finance available for women-led energy businesses, disaggregated by geographic area, educational level
- » Percentage of displaced people and affected communities with access to sustainable energy (disaggregated by energy end-use, gender, geographic location)
- » Number of countries using environmental impact assessment and a participatory process in land use planning related to the production and distribution of energy, involving indigenous populations and other affected communities (disaggregated by geographic location, wealth quintile) (UN Energy)

### Cost Effectiveness of Renewables

Recent studies indicate that the cost of renewable energy is significantly lower now than maintaining old fossil-based systems such as coal power plants and it is even less costly to build new RE installations (see also IRENA, 2022; Roser, 2020; Gimón, 2023).

FIGURE 9 COST OF RENEWABLES 2010-2021



Source: IRENA, 2022.

## EXCERPT

### Why did renewables become so cheap so fast?

The fundamental driver of this change is that renewable energy technologies follow learning curves, which means that with each doubling of the cumulative installed capacity their price declines by the same fraction. The price of electricity from fossil fuel sources however does not follow learning curves so that we should expect that the price difference between expensive fossil fuels and cheap renewables will become even larger in the future.

This is an argument for large investments into scaling up renewable technologies now. Increasing installed capacity has the extremely important positive consequence that it drives down the price and thereby makes renewable energy sources more attractive, earlier. In the coming years most of the additional demand for new electricity will come from low- and middle-income countries; we have the opportunity now to ensure that much of the new power supply will be provided by low-carbon sources.

Falling energy prices also mean that the real income of people rises. Investments to scale up energy production with cheap electric power from renewable sources are therefore not only an opportunity to reduce emissions, but also to achieve more economic growth – particularly for the poorest places in the world” (Roser, 2020).

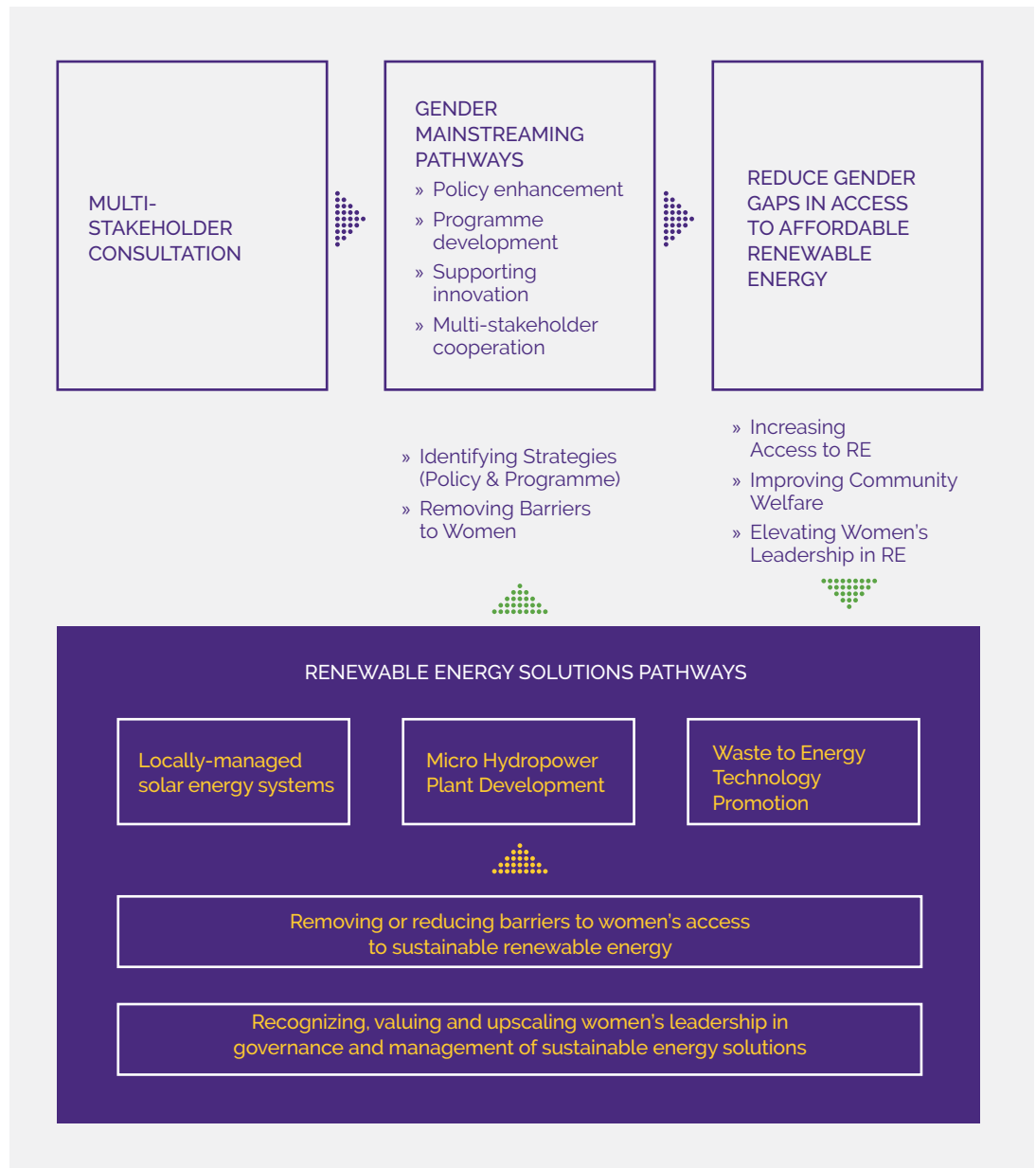
## 4.3 WHAT CAN SSTC PARTNERS DO TO REDUCE GENDER INEQUALITY WHILE PROMOTING RENEWABLE ENERGY?

For purposes of the SSTC-RE, a simple results chain (Figure 1) is proposed to address some of the key issues discussed, focusing on policy enhancement, programme development, innovation promotion, and multi-stakeholder cooperation, in the development of (a) locally-managed solar and other sustainable renewable energy, (b) RE-enabled micro hydro power plant development, and (c) promotion of waste-to-energy technologies. These three priorities (adapted from prior discussions of the SSTC-RE cooperating countries) must be pursued through gender mainstreaming strategies focused on (a) removing/minimizing barriers to women's access to sustainable renewable energy and (b) recognizing, valuing and upscaling women's leadership in management of sustainable energy solutions.

The ultimate objective of the Concept Paper is to reduce key gender gaps in access to sustainable, renewable energy for women and their communities by looking at current and emerging good practices in democratizing solar energy systems, enabling micro hydropower plants, and conversion of waste into energy that can be supported and upscaled through public policy development, programme formulation, funding innovations in women-led solutions, and public-private-community cooperation.

While simultaneously focusing on increasing access to sustainable renewable energy solutions that can be managed at community or meso-level (thereby democratizing access to renewable energy) through public policy, it is also important to identify and address the barriers that marginalizes women in participating in and benefiting from emerging and innovative solutions. The whole results chain requires the development of women's leadership in the management of renewable energy at local, national and international levels.

FIGURE 10 RESULTS CHAIN IN ENABLING GENDER-RESPONSIVE TRANSITION TO RENEWABLE ENERGY



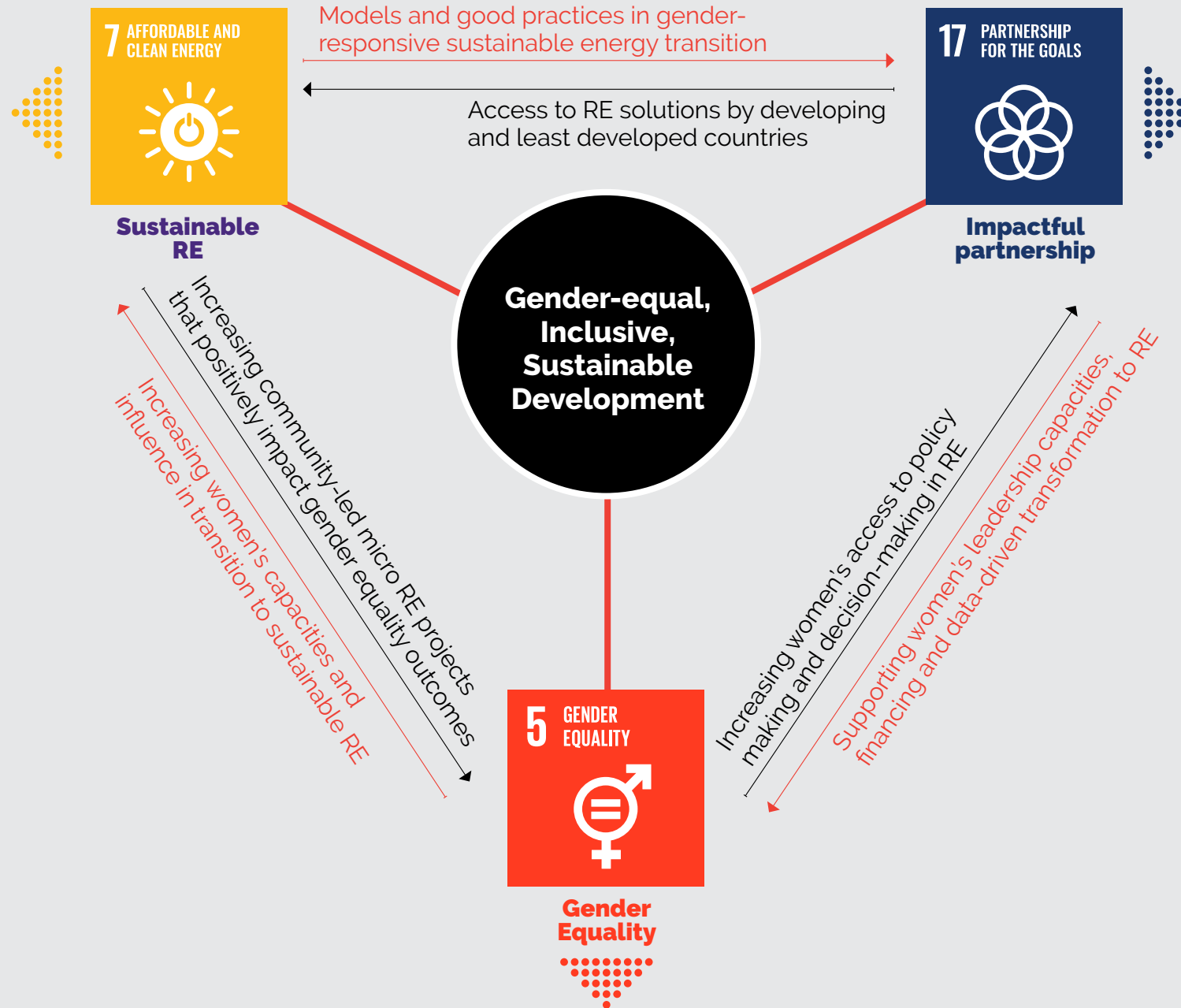
This section outlines the options for each the gender mainstreaming in RE pathways with specific suggestions for each SSTC-RE cooperating countries (Table 8). The RE solutions pathways are focused on democratizing solar energy systems, enabling micro hydropower plant development, and conversion of waste into energy; each with specific pathways for gender mainstreaming and suggested indicators that SSTC-RE cooperating countries can adopt and further develop. The country-specific recommendations respond to the challenges identified in the Stocktaking Paper and are by no means exhaustive nor exclusive to the country as indicated. As such, SSTC-RE countries can select policy and strategy options from the range of gender mainstreaming, indicators and country-specific recommendation in identifying their priorities for action to advance and expedite gender parity in achieving SDG-7.

The framework is informed by the following conceptual framework that shows the interconnectedness of SDGs on gender equality (SDG 5), energy (SDG 7) and partnerships (SDG 17), refer to Figure 9.



By 2030,

- ensure universal access to affordable, reliable and modern energy services
- increase substantially the share of renewable energy in the global energy mix
- enhance international cooperation to facilitate access to clean energy research and technology
- expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing and least developed countries



By 2030,

- Developed countries to implement fully their official development assistance commitments
- Mobilize additional financial resources for developing countries from multiple sources
- Adopt and implement investment promotion regimes for least developed countries
- Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms
- Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries
- Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation
- Enhance policy coherence for sustainable development Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries
- Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships
- enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts
- build on existing initiatives to develop measurements of progress on sustainable development

By 2030,

- End all forms of discrimination against all women and girls everywhere
- Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation
- Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation
- Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility
- Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life
- Ensure universal access to sexual and reproductive health and reproductive rights
- Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources
- Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women
- Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

FIGURE 11 GENDER-RESPONSIVE, INCLUSIVE AND SUSTAINABLE RE FRAMEWORK FOR SSTC-RE

TABLE 8. PATHWAYS IN MAINSTREAMING GENDER IN PROMOTING RENEWABLE ENERGY TO ACHIEVE SDG-7

RE SOLUTION PATHWAYS	GENDER MAINSTREAMING PATHWAYS	EXAMPLES OF INDICATORS	COUNTRY-SPECIFIC RECOMMENDATIONS
<p><b>National enabling policy development for RE promotion</b></p>	<p>Development of <b>strategic plan and enabling policies</b> at national level towards gender equal and inclusive transition to sustainable RE that translate women's equality rights into renewable energy targets</p> <hr/> <p>Inclusion of <b>gender-sensitive targets and strategies in national and local climate change adaptation and mitigation action plans</b> including updating/reporting on NDCs with gender lens</p> <hr/> <p>Development of <b>national framework, standards, guidelines and guardrails</b> on sustainable RE systems development with clear gender equality measures and that facilitates community ownership and right to information with a view towards just energy transition</p> <hr/> <p><b>Targeting and measuring investments in RE</b> as a percentage of national and local government budgets</p>	<ul style="list-style-type: none"> <li>» Number of countries with enabling policies and guidelines on increasing women and community access to renewable energy</li> <li>» Rate of increase/ Number of communities with access to renewable energy</li> <li>» Number of countries that transitioned from fossil fuel to RE (by MW, service reached, value)</li> <li>» Economic benefits by sex (e.g., employment data, new business, increase in income, reduction in poverty, increased years of schooling of women and girls, increased nutrition status and food security)</li> <li>» Social benefits by sex (e.g., reduction in cases of gender-based violence; increased feeling of safety, role in decision-making etc.)</li> <li>» Improvements in time-labour expenditure of women in household chores</li> <li>» Increased time and human energy contribution to household work among men and boys</li> </ul>	<p><b>Indonesia</b></p> <ul style="list-style-type: none"> <li>» Research and disaggregated data collection including assessment of National Medium Term National Planning Framework (2020-2024) to reflect changes in gender equality dimensions in the energy sector and identify opportunities to strengthen access to sustainable RE with gender equity benefits</li> <li>» Development of supplementary policy to increase women's access to financing, finance services, including guidelines for promoting gender-responsive green finance.</li> <li>» Formulation of gender-responsive supplementary guidelines for rolling out the implementation of President Regulation No 16/2018 focusing on procurement (installation) of RE for construction or maintenance of public infrastructure (offices, schools, hospitals etc.) to increase access to essential public services by women and persons with disability</li> </ul>

RE SOLUTION PATHWAYS	GENDER MAINSTREAMING PATHWAYS	EXAMPLES OF INDICATORS	COUNTRY-SPECIFIC RECOMMENDATIONS
	<p><b>Increasing types of financing modalities</b> for community-led or micro RE systems who subscribe on the national standards; <b>eliminating financing barriers to small-scale producers and incentivising women-led projects</b></p> <hr/> <p>Policy framework, guidelines and tools for the development of local policies and programmes to <b>increase RE coverage</b></p> <hr/> <p>Creation of <b>interdisciplinary institutional mechanism for mainstreaming gender in the energy sector</b> (responsible for planning, budgeting, implementation, monitoring and policy development)</p> <hr/> <p><b>Development of gender responsive, inclusive, sustainable RE innovation centre</b> to discover and promote sustainable, gender equal and affordable RE</p> <hr/> <p><b>Research</b> (baseline and endline) in achieving <b>SDG-7 and mass communication campaign on energy and gender equality</b></p>	<ul style="list-style-type: none"> <li>» Increased assets owned by women (cash, land, productive assets, insurance, etc.)</li> <li>» Increased women's access to information through ownership or ability to purchase communication devices such as mobile phones, radio, and internet data</li> <li>» Increased women's access to scholarships, training and professional development opportunities in STEM and non-gender traditional careers in the RE sector</li> <li>» Reduced gender disparity in education and in enrolment rates in STEM and non-gender traditional courses</li> <li>» Reduced gender-based violence in the home, school and community</li> </ul>	<p><b>Madagascar</b></p> <ul style="list-style-type: none"> <li>» Development of national enabling policy on gender equality (see for example, Philippines' Magna Carta of Women) or national gender mainstreaming framework that outlines the goals, strategies and institutional mechanisms for achieving gender equality</li> <li>» Translating the constitutional right to gender equality by developing a gender-responsive RE transition strategic plan</li> <li>» Increase national investments in RE to power rural communities, households, schools and other public infrastructure as well as expand access to water and sanitation facilities that are well-lighted, with a view to increase women's opportunities for livelihood diversification within the community (promoting less job-related migration), reducing maternal mortality rates and adolescent birth rates and to mitigate exposure of women and girls to gender-based violence with disability</li> </ul>

RE SOLUTION PATHWAYS	GENDER MAINSTREAMING PATHWAYS	EXAMPLES OF INDICATORS	COUNTRY-SPECIFIC RECOMMENDATIONS
	<p><b>Scholarships, training and support to professional development of women</b> in various subsectors of the energy industry (as technicians, managers, etc.) including promoting women to go into STEM track</p>		<p><b>Nepal</b></p> <ul style="list-style-type: none"> <li>» Development of • Target increased coverage of RE systems in de facto women-headed households with a view to increase women's opportunities for livelihood diversification within the community (promoting less job-related migration), reducing maternal mortality rates and adolescent birth rates and to mitigate exposure of women and girls to gender-based violence</li> <li>» Accessibility of RE in social services, such as educational institutions, health posts/centres and public lightings to improve maternal health, and women's mobility and safety (eg. Inaccessibility of lightings such as streetlights due to lack of reliable energy sources) to participate in outdoor social and economic activities even after dark.</li> <li>» Assessment of rural electrification programmes and subsidy policy on their gendered impacts towards developing a national energy transition plan to increase rural and urban community as well as women's access to RE sources</li> </ul>
<p><b>Locally managed RE systems (solar, micro-hydropower and waste-to-energy technologies)</b></p>	<p>Support to local government authorities in <b>accessing climate financing schemes</b> including green financing schemes</p> <hr/> <p><b>Installation of locally managed solar, micro-hydropower infrastructure</b> targeting communities with highest female poverty rates</p> <hr/> <p><b>Studies, practical guides, and information resource development</b> on gender-responsive, sustainable, and community-led RE systems</p> <hr/> <p>Development and strengthening <b>watershed management</b> to protect and regenerate water resources and natural environment that promotes women's participation, control and benefit</p>	<p><b>Increased access</b></p> <ul style="list-style-type: none"> <li>» Decreased time of power outages</li> <li>» Increased proportion of RE in household energy mix/options for fuel efficiency</li> <li>» Increased RE-sourced electricity coverage (households served)</li> <li>» Increase in the number of women in non-gender traditional work and employment in the energy sector</li> <li>» Increased women's time for diversifying livelihoods and/or lifelong education and training</li> <li>» % of new women-led and community-based RE installations to total installations</li> <li>» # of new RE installations in disaster-affected areas</li> <li>» # of new RE installations in remote or hard-to-reach areas and indigenous communities</li> </ul>	

RE SOLUTION PATHWAYS	GENDER MAINSTREAMING PATHWAYS	EXAMPLES OF INDICATORS	COUNTRY-SPECIFIC RECOMMENDATIONS
		<p><b>Affordability</b></p> <ul style="list-style-type: none"> <li>» Reduced electricity cost</li> <li>» Decreasing cost of installations over time</li> <li>» Number of affordable RE installations (# of women-led, community-based facilities)</li> </ul> <p><b>Gender equality</b></p> <ul style="list-style-type: none"> <li>» Reduced women's time in food preparation and household chores</li> <li>» Increased volume and value of credit extended to women (public and private/formal)</li> <li>» Increased access to chore-reducing appliances (e.g., washing machines, rice cooker, etc.)</li> <li>» Increase in the number of women in management and decision-making positions in energy-relevant ministries</li> <li>» Increased number of women-led MSMEs in the energy value chain</li> </ul>	<p><b>Germany</b></p> <ul style="list-style-type: none"> <li>» Assistance in the development of a "model policy or strategy" for gender-responsive, inclusive, sustainable RE transition that countries can use as basis for Global South partners to adapt in their national context</li> <li>» Developing and promoting green or sustainable financing models to increase women's benefit to sustainable energy transition, access to resources, and increased roles in policy making and decision-making towards RE transition – through tri-sector partnership and learning exchange (government-business-community)</li> <li>» Sharing own models and experiences in provision of green financing and green jobs and supporting national policy development in these areas to strengthen expansion of RE coverage in Global South countries</li> </ul>

RE SOLUTION PATHWAYS	GENDER MAINSTREAMING PATHWAYS	EXAMPLES OF INDICATORS	COUNTRY-SPECIFIC RECOMMENDATIONS
		<p><b>Increased investment in RE</b></p> <ul style="list-style-type: none"> <li>» Increase in volume and value of financing to locally managed RE</li> <li>» Reduced volume and value of investments in fossil fuel energy development projects</li> <li>» Value of RE subsidies for women-led RE and community-based RE projects</li> <li>» Value of RE credit facilities extended to women-led households and other poor households</li> <li>» Increase in volume and value of financing awarded to women-led enterprises across the RE value chain</li> <li>» Reduced number of villages/ administrative districts with high female poverty rates</li> <li>» Increased coverage and effectiveness of watershed management (government led and community led)</li> </ul>	<ul style="list-style-type: none"> <li>» Providing support to research (in universities, journal publication, and in development institutions) in measuring achievement of gender equality targets in SDG-7 as well as to build a knowledge base on gender and RE</li> <li>» Supporting knowledge exchange between women professionals and in energy-related institutions to strengthen gender mainstreaming in the RE energy sector including creative human resource development approaches (such as secondments, leadership coaching, mentoring, supporting innovation hubs, etc.)</li> <li>» Expansion of country partners in Africa, South Asia and Southeast Asia in south-south cooperation to promote new models of gender-responsive RE practices</li> </ul>



## REFERENCES

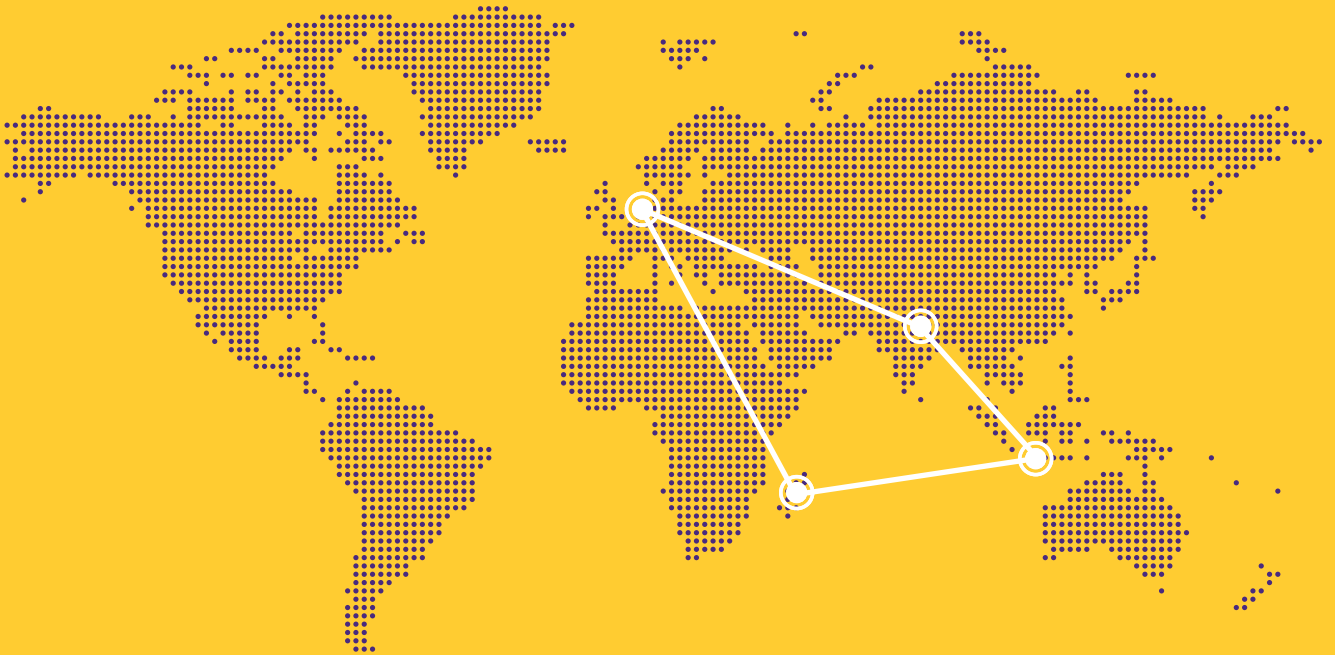
- Alkire, S., Kanagaratnam, U., and Suppa, N. (2022a). 'The global Multidimensional Poverty Index (MPI) 2022 country results and methodological note', OPHI MPI Methodological Note 52, Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.
- Alkire, S., Kanagaratnam, U., and Suppa, N. (2022b). 'The global Multidimensional Poverty Index (MPI) 2022 disaggregation results and methodological note', OPHI MPI Methodological Note 53, Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.
- Apergis, N., Polemis, M., Sourso, S-E., 2022. Energy poverty and education: Fresh evidence from a panel of developing countries, in *Energy Economics* (Volume 106, February 2022, 105430). DOI: <https://doi.org/10.1016/j.eneco.2021.105430>
- ASEAN Secretariat, 2020. ASEAN Plan of Action on Science, Technology and Innovation (APASTI) 2016-2025, <https://asean.org/book/asean-plan-of-action-on-science-technology-and-innovation-apasti-2016-2025/>
- ClimateWatch, 2023. Data Explorer (database), <https://www.climatewatchdata.org>
- Energia, 2022. Building the Business Case for Women's Inclusive Financing in Last-Mile Renewable Energy Markets in Sub-Saharan Africa, [https://www.energia.org/assets/2023/02/Womens\\_Inclusive\\_Financing\\_Report\\_Final.pdf](https://www.energia.org/assets/2023/02/Womens_Inclusive_Financing_Report_Final.pdf)
- Eurofound, 2017. European Pact for Gender Equality, <https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/european-pact-for-gender-equality>
- Gender and Energy Compact, 2023. About the Gender and Energy Compact, <https://genderenergycompact.org/compact/>
- German Sustainable Finance Strategy, 2021. [https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press\\_Room/Publications/Brochures/sustainable-finance-strategy.pdf?\\_\\_blob=publicationFile&v=8#:~:text=The%20Sustainable%20Finance%20Strategy%20is,goal%20of%20sustain%2D%20able%20finance.](https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press_Room/Publications/Brochures/sustainable-finance-strategy.pdf?__blob=publicationFile&v=8#:~:text=The%20Sustainable%20Finance%20Strategy%20is,goal%20of%20sustain%2D%20able%20finance.)
- Gimons, E., 2022. 99% Of U.S. Coal Plants Are More Expensive Than New Renewables. A Coal-To-Clean Transition Is Worth \$589 Billion, Mostly In Red States, in *Forbes* (Jan 30, 2023), <https://www.forbes.com/sites/energyinnovation/2023/01/30/99-of-us-coal-plants-are-more-expensive-than-new-renewables-a-coal-to-clean-transition-is-worth-589-billion-mostly-in-red-states/?sh=692b06052510>
- Institute for Climate and Sustainable Cities, 2023. RE-Charge Pilipinas, <https://icsc.ngo/rcp/>
- IRENA, 2020. Press Release. Renewables Increasingly Beat Even Cheapest Coal Competitors on Cost.
- Monsivais, P., Aggarwal, A., Drewnowski, A., 2020. Time Spent on Home Food Preparation and Indicators of Healthy Eating, in *American Journal of Preventive Medicine* (Volume 47, Issue 6, P796-802, December 2014). DOI: <https://doi.org/10.1016/j.amepre.2014.07.033>



- Novirianti, D., 2022. SSTC RE Stocktaking Paper on Gender Mainstreaming in Renewable Energy
- OECD, 2021. 8. Women and SDG 7 – Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all, in Gender and the Environment: Building Evidence and Policies to Achieve the SDGs. Paris: OECD Publishing. <https://doi.org/10.1787/3d32ca39-en>.
- OPHI, 2022a. Global Multidimensional Poverty Index. <https://ophi.org.uk/multidimensional-poverty-index/>
- OPHI, 2022b. Table 7.1 MPI results by gender of household head. <https://ophi.org.uk/multidimensional-poverty-index/data-tables-do-files/>
- [https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press\\_Room/Publications/Brochures/sustainable-finance-strategy.pdf?\\_\\_blob=publicationFile&v=8](https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press_Room/Publications/Brochures/sustainable-finance-strategy.pdf?__blob=publicationFile&v=8)
- Roser, M., 2020. Why did renewables become so cheap so fast? In Our World in Data, <https://ourworldindata.org/cheap-renewables-growth>
- SSTC RE Concept of Cooperation, 2021
- Sule, I.K., Yusuf, A.M., Salihu, M.K., 2022. Impact of energy poverty on education inequality and infant mortality in some selected African countries, in Energy Nexus (Volume 5, 16 March 2022, 100034). DOI: <https://doi.org/10.1016/j.nexus.2021.100034>
- Sustainable Energy for All, 2020. Energizing finance: Understanding the Landscape 2020. <https://www.seforall.org/publications/energizing-finance-understanding-the-landscape-2020>
- United Nations Development Programme (UNDP) and Oxford Poverty and Human Development Initiative (OPHI), 2022. Global Multidimensional Poverty Index. <https://hdr.undp.org/system/files/documents/hdp-document/2022mpireportenpdf.pdf>
- UNDP, 2023a. Gender Development Index. <https://hdr.undp.org/gender-development-index#/indicies/GDI>
- UNDP, 2023b. Gender Inequality Index. <https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII>
- United Nations Department of Economic and Social Affairs (UN DESA), UNESCWA, WHO, 2021. Theme Report on Enabling SDGs through Inclusive, Just Energy Transitions, [https://www.un.org/sites/un2.un.org/files/2021-twg\\_3-b-062321.pdf](https://www.un.org/sites/un2.un.org/files/2021-twg_3-b-062321.pdf)
- United Nations Climate Change, 2023. Introduction to Climate Finance. <https://unfccc.int/topics/introduction-to-climate-finance#:~:text=Climate%20finance%20refers%20to%20local,that%20will%20address%20climate%20change.>
- World Bank, 2022. The Global Findex Database 2021 (Data Download and Documentation), <https://www.worldbank.org/en/publication/globalfindex/Data>









**A CONCEPT PAPER  
FOR GENDER MAINSTREAMING  
IN SOUTH-SOUTH TRIANGULAR  
COOPERATION**

on Renewable Energy between Madagascar, Nepal,  
Indonesia and Germany (SSTC RE)

Supported by: the joint Indonesian-German project on  
**STRENGTHENING CAPACITIES FOR POLICY PLANNING  
FOR THE IMPLEMENTATION OF THE 2030 AGENDA IN  
INDONESIA AND IN THE GLOBAL SOUTH (SDGs SSTC)**



implemented by:  
**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH