

Linking LCA and SDG

7

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Date: 21 April 2023

Version: 2

Commissioned by: UNEP Life Cycle initiative and contributing companies

Prepared by: PRé Sustainability
Shaniq Pillay
Rosan Harmens

About PRé

For thirty years PRé has been at the forefront of life cycle thinking and has built on its knowledge and experience in sustainability metrics and impact assessments to provide state of the art methods, consulting services and software tools. Internationally, leading organizations work with PRé to integrate sustainability into their product development procedures in order to create business growth and business value. PRé has an office in the Netherlands and a global partner network to support large international or multi-client projects.

Get in touch with us

Do you have a sustainability challenge for us? We would be happy to discuss it together.

PRé Sustainability B.V.

Stationsplein 121

3818 LE Amersfoort

The Netherlands

T +31 33 455 50 22

E consultancy@pre-sustainability.com

W pre-sustainability.com

PRé Sustainability is a trade mark, held by © PRé Sustainability B.V., Amersfoort, The Netherlands. All rights reserved. All trademarks acknowledged. PRé Sustainability B.V. is fully and privately owned by the management and registered with the Dutch Chamber of Commerce (Amersfoort) under number 32099599.

Table of contents

7	Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all.....	4
7.1	Introduction	4
7.2	Targets and indicators of SDG 7	5
7.3	Classifying the links between SDG targets and LCA impact categories	6
7.3.1	Target 7.1 Universal access	6
7.3.2	Target 7.2, 7.3 Increase renewable energy in the global mix, increase energy efficiency and enhance international co-operation	7
7.4	Overview of links	8
7.5	Characterizing the relation between LCA and SDG 7	8
7.5.1	Environmental LCA	9
7.5.2	Social LCA	9
7.6	Scoring matrix for SDG 7	12
7.7	References	13

7 Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

7.1 Introduction

Energy is a vital part of our every day lives. A well-established energy system supports many sectors: from businesses, medicine and education to agriculture, infrastructure, communications and high-technology. And conversely, a lack of access to energy supply constrains human and economic development (UN, 2021a)

Despite the progress made in transitioning to the green economy, the world still has a long way to go to provide affordable, reliable and sustainable energy for all. Figure 1 below illustrates the gradual decrease in fossil fuel related fuel use and the uptake of renewable forms of hydropower, wind, solar and other forms of renewable energy. Developing countries had 219 Watts per capita of renewable energy at the end of 2019 which translates to an increase of 7% from the previous year (UN, 2021b).

Solar and wind capacity expanded much faster than population growth, increasing by a per capita capacity of 22.2% and 11.3% respectively. The international flows to support clean and renewable energy reached \$14 billion in 2018, this is 35% lower than in 2017 and 32% higher

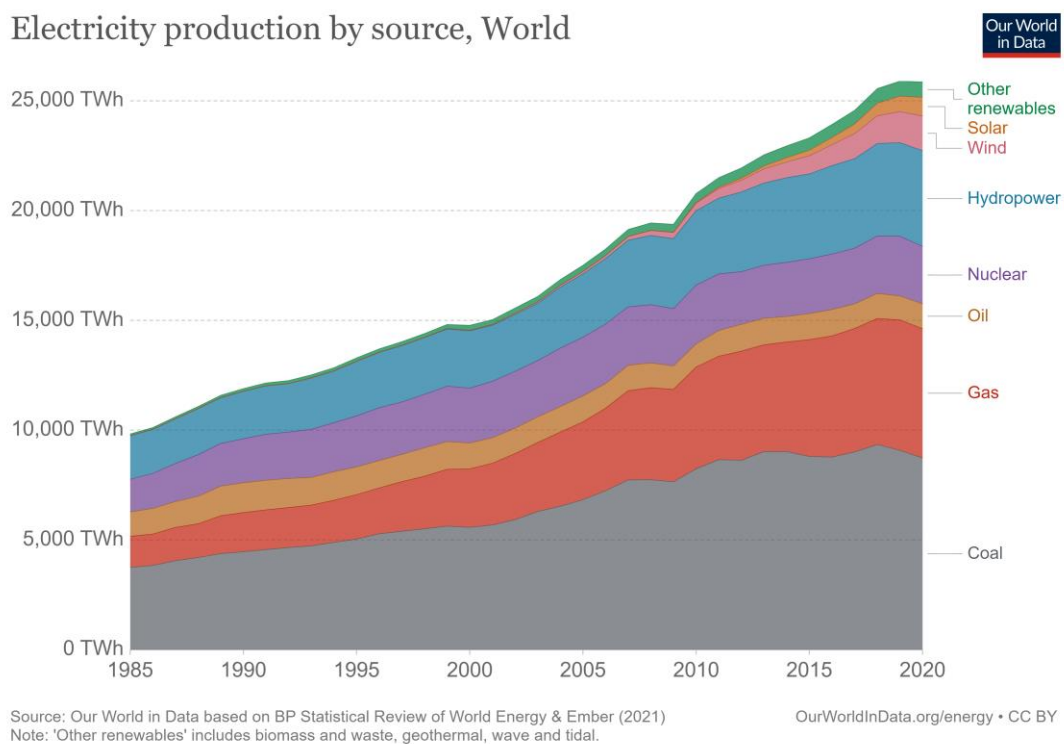


Figure 1: Electricity production by source, World (Our world in data, accessed on 1st July 2021)

than in 2010. Hydropower projects received 27% of 2018 flows, while solar projects received 26%, geothermal 8%, wind 5%, and multiple/other renewables 34%.

The electricity access rate increased from 83% in 2010 to 90% in 2019. Despite these efforts, there are still about 660 million people without electricity in 2020. In 2019, 66% of people has access to clean cooking fuel and technologies and much of this took place in low- and middle-income countries. People relying on highly pollutive fuels can have serious health consequences in the form of cardiovascular and respiratory system diseases.

Globally, energy intensity improved from 5.6 MJ per dollar GDP in 2010 to 4.8 in 2018 which translates to an annual rate improvement of 2%. In order to reach target 7.3, annual improvement will need to reach an average of 3%.

7.2 Targets and indicators of SDG 7

The main aim of this goal is to transition the energy industry away from fossil fuel usage through a coordinated effort put into the uptake of renewable energy. At the same time the goal aims to address the issues associated with accessibility, affordability and reliability with regards to energy supply in poorly developed areas. In addition, this includes the expansion of infrastructure required for the distribution of this energy and upgrading the required technology.

This goal largely links to companies who provide energy or energy infrastructure as well as technological innovations related to energy provision and the transition to green forms of energy.

The most relevant links to environmental impact are to climate change and fossil fuel conservation as these have a direct link with a majority of current energy provision. With regards to social impact, the main topics involve stakeholders' access to electricity and the infrastructure required for its distribution.

Because energy is such an enabling resource, this goal links closely to goal 1: no poverty, goal 2: zero hunger, goal 3: good health & well-being and directly to goal 13: climate action.

Table 1. The targets and indicators defined for SDG 7

Target	Indicator
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Proportion of population with access to electricity 7.1.2 Proportion of population with primary reliance on clean fuels and technology
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption

7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP
7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	7.a.1 International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems
7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	7.b.1 Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services

7.3 Classifying the links between SDG targets and LCA impact categories

Asterisk (*) represents a link that is established under specific condition outlined under the target.

Underlined topics represent those that are deemed critical by the SDG Assessment methodology.

7.3.1 Target 7.1 Universal access

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

Social LCA:

- **Worker's remuneration**: when a company contributes to this topic, they are ensuring that workers are paid sufficiently to be able to afford energy services. Without sufficient compensation, workers may succumb to energy poverty which could mean they have no access to electricity (Indicator 7.1) or switch to unsustainable fuels such as illegally harvested firewood etc.(Indicator 7.2) . Companies that pay their workers below minimum wage are in that way indirectly responsible for the use of unsustainable fuel source use and the unavailability of electricity
- **User's affordability***: under the condition that a company operates as an energy provider, it contributes to this topic by ensuring that the selling price of its service is affordable to the user. This assessment should be done by assessing the proportion of the average user's income and should consider to what extent this user is at risk of energy poverty. Providing unaffordable energy increases vulnerability to several negative outcomes such as poverty, health and wellbeing,

- **User's accessibility*:** under the condition that a company operates as an energy provider or has significant influence on the provision of energy (all types of energy providers like lamp oil, solar panels, solar lighting, wood for cooking etc.), it contributes to this topic by ensuring that its energy provision is accessible with regards to the distribution. Should the grid be inaccessible and poorly designed so that it does not fit the needs of the user group, a company would contribute negatively to this topic.
- **Local communities' Access to material and immaterial resources*:** when a company contributes to this topic, and when their efforts are related to accessibility to energy provision and restore or improve the state of energy access in the community, this link can be made. This basic resource is vital to live in a healthy community.
- **Small-scale entrepreneurs meeting basic needs:** when a company contributes to this topic, they are ensuring the provision of sufficient revenue to access and afford energy, thereby supporting small-scale entrepreneur's livelihoods. When a company pays below minimum wage, this groups' basic needs will not be met which could mean they have no access to electricity (Indicator 7.1) or switch to unsustainable fuels such as illegally harvested firewood etc.(Indicator 7.2)
- **Small-scale entrepreneurs' access to services and inputs*:** when a company contributes to this topic, and their activities specifically relate to ensuring access to electricity, this link can be established. If the access to electricity is not available while the company sources from these entrepreneurs and they continuously take no action, this will count as a negative contribution.

7.3.2 Target 7.2, 7.3 Increase renewable energy in the global mix, increase energy efficiency and enhance international co-operation

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

Target 7.3 By 2030, double the global rate of improvement in energy efficiency

Environmental LCA:

- **Fossil resource use:** when a company decreases its impact on fossil resources, they are actively seeking out fossil fuel alternative energy sources thereby conserving the natural store within the earth's crust. This relates specifically to the type of energy the company uses in all its operations linking to target 7.2, or the efficiency of their processes which is linked to 7.3.

7.4 Overview of links

In Figure 2 the overview of the links between LCA impact categories and SDG 7 is shown.

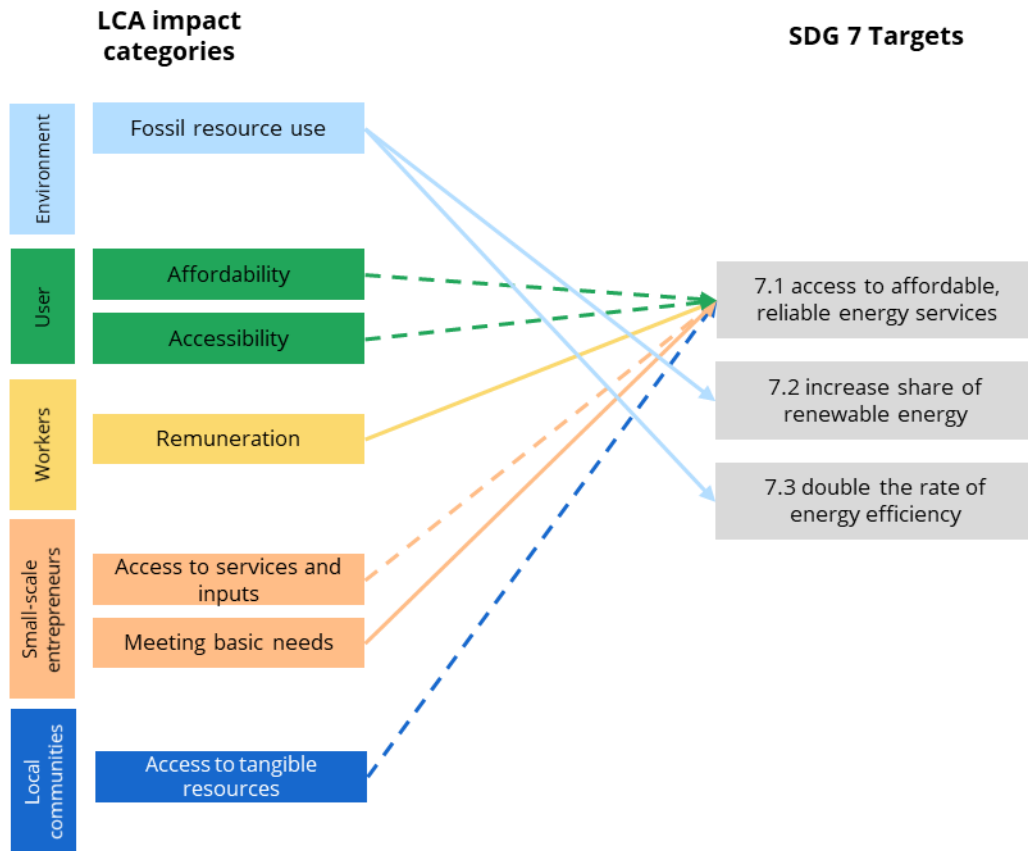


Figure 2 Overview of links between LCA impact categories and SDG targets for SDG 7

7.5 Characterizing the relation between LCA and SDG 7

In this paragraph, the nature of the relation between the impact categories and the targets of SDG 7 are defined. This step determines the score needed to qualify as a contribution to a target, per target and impact category. The first section describes how environmental impact category indicator results can be linked; the second section does the same for social metrics.

Asterisk (*) represents a link that is established under specific condition outlined under the target.

Underlined topics represent those that are deemed critical by the SDG Assessment methodology.

7.5.1 Environmental LCA

Table 7.2 environmental topic linking to SDG 7

LCA impact category	Rationale	Requirements to be counted as a contribution to SDG 7	
Fossil resource use	Use of fossil resources negatively affecting target 7.2 and 7.3.	+2	The environmental impact is a lot lower than the reference product (>10%)
		-1	The environmental impact is a lot lower than the reference product (>5%)
		-2	The environmental impact is a lot higher than the reference product (> 10%)

7.5.2 Social LCA

Table 7.3: Social topic linking to SDG 7

Stakeholder	Social topics	Rationale	Requirements to be counted as a contribution to SDG 6	
Workers	<u>Remuneration</u>	Receiving enough remuneration to afford clean energy sources can contribute to target 7.1	+2	All workers receive the (major share of) additional social benefits as defined for retirement, health insurance, disability coverage on top of the living wage levels for a standard family defined in the Wage-indicator project.
			+1	All workers are paid at least a living wage for a family as defined by the methodology of the Wage indicator.

		-1	Not all workers are paid the living wage for a single household or are not paid the legal or industry minimum wage and/or social benefits are not according to applicable law, but the company has committed to resolve this issue clearly defined timeline.	
		-2	Workers are paid below the poverty line in the country or region, or if this is not defined in the country or region, the payment is clearly insufficient, or workers are not paid the legal or industry minimum wage and/or social benefits are not according to applicable law. There is no commitment to address this issue.	
User	Affordability *	If a company actively makes energy affordable for deprived users, they can contribute to target 7.1	+2	The solution offered by the company is regarded as a disrupter, in the sense it has dramatically increased the affordability for low income or vulnerable groups.
			+1	The product is designed to make products more affordable for underprivileged groups.
			-1	While a group of users would greatly benefit from accessing this product, the company offers these under conditions that are unaffordable to these groups.
			-2	While a group of users would greatly benefit from accessing a product or service, the company offers these under conditions that are unaffordable to this groups and/or it hampers attempts of competitors to sell alternatives solutions that are more affordable to these vulnerable groups.
	Accessibility*	If a company operates as energy provider or has significant influence on the way energy is provided and	+2	The product or service is regarded as a disrupter, in the sense it has introduced products and services that were not, or very limited available to people with disabilities.

	they make energy accessible for users, it contributes to target 7.1	+1	The product or service is designed to significantly improve the access by people in vulnerable groups. The company distributes their products well among these groups.
		-1	The company has a policy to design and market a product with the objective or service with an objective to improve affordability and accessibility but the product does not fulfil these basic standards or it limits access by vulnerable groups.
		-2	The product is poorly designed and not usable or dangerous to use by people that have restricted access.
Local communities	Access to material and immaterial resources* When companies put effort in energy provision for the local community, they can contribute to target 7.1	+2	The company has made the access to material and immaterial resources a top priority and is actively investing in this priority that have resulted in real improvements
		-2	The actions of the company have resulted in incidents of actual damage, adverse impacts or risks to the community's access to material and immaterial resources, but a corrective action plan with a timeline for completion has not been developed.
Small-scale entrepreneurs	<u>Meeting basic needs</u> Having enough revenue to afford clean energy can contribute to target 7.1	+2	The company that sources from this supplier's community has a well-defined policy and activities to actively increase the productivity and quality of the products in a way that raises the income above the level of basic needs, and supports the community with bridge loans when harvests or other sources of income are disappointing due to external factors. The results of this policy are recognised by the community.
		+1	The company that sources from this supplier's community provides has a policy and activities to actively increase the revenue, productivity and quality of the products to create shared value.

		-2	The small-scale entrepreneurs cannot meet basic needs at a minimum poverty level and could not invest in the further development of their farm and business in the most recent period, and no attempts are made by the company that sources from this community to improve this situation.
Access to services and inputs*	Contributing to the access to energy for small scale entrepreneurs can contribute to target 7.1	+2	The company that sources from this supplier's community has provided stability and quality of the access to all four services inputs (see Definition) a top priority.
		-2	Access at least one of the five inputs and services is either unavailable or frequently disrupted, causing significant problems for small-scale entrepreneurs, while the company that sources from these entrepreneurs take no action to address such problems.

7.6 Scoring matrix for SDG 7

Based on the tables above, the following summary can be made as a checklist for determining if the LCA results can support a contribution to SDG 7.

Asterisk (*) represents a link that is established under specific condition outlined under the target.

Underlined topics represent those that are deemed critical by the SDG Assessment methodology.

Table 7.4: Scoring matrix for determining whether the LCA results can indeed support SDG 7

SDG 7	Red flag (-2) or blocking (🚫)		Contributing		
Target 7.1					
<u>Remuneration</u>	🚫	-1		+1	+2
Affordability*	-2	-1		+1	+2
Accessibility*	-2	-1		+1	+2
Access to material and immaterial resources*	-2				+2

Meeting basic needs	⊘		+1	+2
Access to services and inputs*	-2			+2
Target 7.2				
Fossil resource use	-2	-1		+2
Target 7.3				
Fossil resource use	-2	-1		+2

7.7 References

Our World in Data, based on BO statistical review of world energy & ember, 2021.

UN, 2021a. "Why it matters: Affordable and Clean Energy". Via:
https://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/7_Why-It-Matters-2020.pdf

UN, Economic and Social council. 2021b. Progress towards the Sustainable Development Goals, Report of the Secretary-General. See:
https://sustainabledevelopment.un.org/content/documents/27610SG_SDG_Progress_report_2021.pdf