



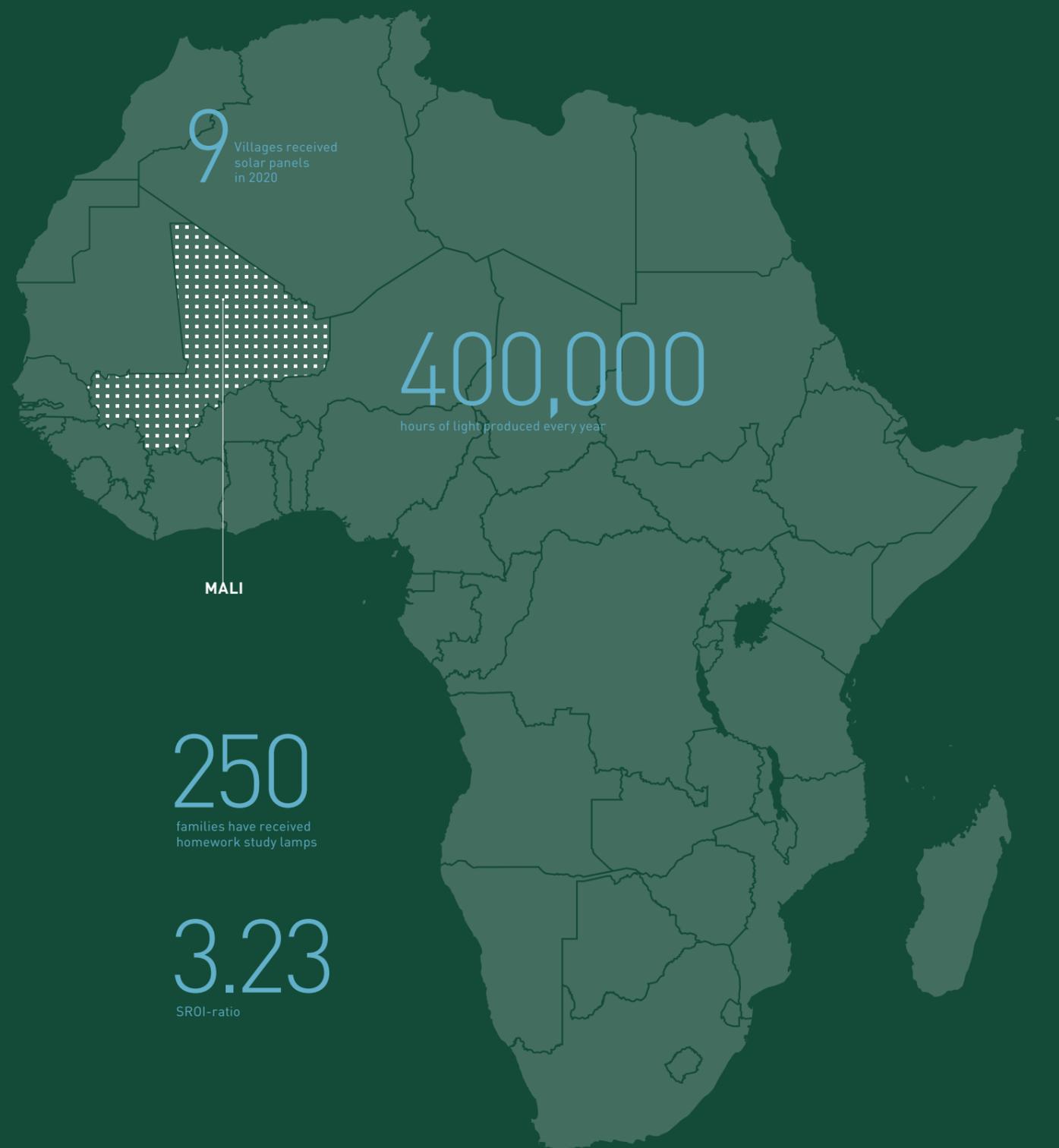
Danske
Commodities

LIGHT OVER MALI

Annual Social Return on
Investment Report 2020

>28% of the rural population in Mali has access to electricity

12,000 people given access to light annually



250 families have received homework study lamps

3.23 SROI-ratio

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ABSTRACT

Danske Commodities helps provide access to affordable and sustainable energy in unserved areas of the world. In 2020, our CSR-project Light over Mali has provided electricity to 12,000 Malians after dark and generated +400,000 hours of light by supplying renewable energy to rural villages in Mali.



The concept of micro-generation makes it possible to install solar panels in off-grid villages in rural Mali, without building costly power grids supplied by conventional power. In 2020, Danske Commodities helped install solar panels at five schools, five health clinics, established five lamp posts in city centres and distributed 250 solar-powered homework lamps to children.

These new sources of light have provided new opportunities for the villages after dark:

- Health clinics can cool medical supplies, treat diseases or help deliver babies.
- The schools can provide basic education to adults who work during the day and, as such, only have the evenings to improve their skills. Also, children from primary and secondary schools can use the classrooms in the evenings to prepare for exams.
- Public street lights help enhance safety at night.
- The homework lamps enable children living in remote locations to study after dark.

- Also, local villagers receive fundamental training in maintaining the solar panel systems, which is a prerequisite for keeping the solar panels up and running.

In order for these installations to generate sustainable value for Malian society, priority is given to health and education – for both adults and children. Improved health and education are the first steps to be taken to improve quality of life and to change the entrenched correlation between rates of electrification and illiteracy – which in rural areas of Mali is as high as 70%¹.

THE OUTCOME

The method used in this paper is Social Return on Investment (SROI), which measures the value of providing rural villages with electricity. The SROI method converts the social effort into a ratio by comparing input and output.

The SROI ratio based on the 2020 evaluation of the Light over Mali project is calculated at 3.23, while over 10-year period the SROI ratio is 10.67. This monetary estimate means that for every DKK 1 spent on Light over Mali, the project generates DKK 10.67 over a 10-year period.

ADDITIONAL VALUE CREATION

Additional areas of value have been identified:

- Light at health clinics helps save women, and especially babies, from dying during childbirth
- Public streetlights heighten security and help the villagers avoid dangerous animals during the night
- With higher-quality lighting, household members can be expected to engage in a wider range of activities e.g. socialising, reading and productive activities, such as handicrafts.
- As children's study hours increase, one can expect they will have a higher school attendance and eventually a higher grade completion, which might also result in a higher future income.
- Investments in education help keep young people in the local communities and strengthen the rural economy.

These effects are also expected to have a long-term impact.

¹ Nordic Folkecenter for Renewable Energy (2015): Light over Mali, Danmark.



PURPOSE

In the developed world, energy is almost universally available and accessible: light at the flick of a switch to light up homes, schools, hospitals, refrigerate food, or keep cool in rising temperatures. In many parts of the developing world, the picture is very different. In most African countries, the larger part of the population has no or limited access to electricity. Despite widespread progress, around 600 million people remain without access to electricity¹.

The purpose of this Social Return on Investment report is to evaluate the value creation of Light over Mali in 2020.

It is a central part of Danske Commodities' approach to corporate social responsibility to measure and evaluate the relationship between the input and outcome of the project to assess the impact and socioeconomic effects of providing rural villages in Mali with solar panels at schools and health clinics.

The report covers the impact generated for 12,000 children and adults living in nine rural villages in Mali.

¹ <https://www.statista.com/statistics/1221698/population-without-access-to-electricity-in-africa/>

PROJECT PRESENTATION

Solar power is a fairly simple solution for bringing electricity to un-served areas of the world, as renewable energy by nature is decentralised and can be installed in every village and on every rooftop.

DC's project is part of a larger project called Light over Africa, which was established by Mali Folkecenter in collaboration with Nordisk Folkecenter.

MALI FOLKECENTER

Mali Folkecenter is a local NGO that counsels the Malian government on climate change, environmental protection, renewable energy issues and access to sustainable, decentralised energy solutions in Mali and West Africa.

Mali Folkecenter was established in 1999 by PhD Ibrahim Togola, who founded the NGO after being a trainee at Nordisk Folkecenter. Over the past 20 years, Mali Folkecenter has built solid experience in working with rural communities, influencing policies and strengthening actors at different levels of responsibility.

NORDISK FOLKECENTER

Nordisk Folkecenter is an independent Danish NGO and renewable energy research facility, which provides industrial innovation, information, training and implementation of renewable energy technologies and energy savings across the world.

LIGHT OVER MALI

In 2020, Danske Commodities donated DKK 200,000 to Light over Mali to help improve living conditions in nine different villages, creating tangible value for 12,000 Malians.

SOLAR PANELS AT SCHOOL

With solar panels installed at schools, men and women are able to attend evening classes to acquire basic educational skills when they are not working. Also,

children from primary and secondary schools can use the classrooms in the evenings to prepare for exams and tests while receiving academic support from teachers.

SOLAR PANELS AT HEALTH CENTRES

The solar panels installed at health clinics make the medical facilities operational after dark, increasing the service level and quality of care. This means that the clinics can treat diseases, keep medicine cool and help deliver babies at night.

SOLAR-POWERED HOMEWORK LAMPS

Children living in remote locations are given solar-powered lamps, so that they can prepare their homework after the sun sets.

SOLAR-POWERED PUBLIC STREETLIGHTING

Public solar-powered streetlights installed in city centres enable patients to find their way to the health clinics and minimise the risk of theft.

TRAINING IN MAINTAINING THE SOLAR PANELS

Local villagers are trained to install solar panels. Two people from each village – a man and a woman – receive fundamental training in maintaining the solar panel systems.

ENERGY POTENTIAL IN MALI

Mali is currently reliant on fossil fuel imports, exposing the country to price volatility and unreliable supply. Around 28% of the country's rural population lack access to electricity. However, the potential for renewable energy is vast. Mali has 3046 hours of sunlight per year¹ which is approximately 55% more than in Denmark (1690 hours of sunlight per year)².

THE IMPACT OF THE PANDEMIC

The Covid-19 epidemic impacted Mali in similar ways as the rest of the world. Although the official contamination numbers were low, precautions were taken in the beginning of the pandemic by closing the schools for several months. Fortunately, it was possible to realise the solar panel installations in the selected nine villages.

¹ <http://www.ogimet.com/cgi-bin/gclimat?months=12&lang=en&mode=0&ind=61291&ord=DIR&year=2019&mes=12>

² <https://www.dmi.dk/vejrkarkiv>

TABLE 1 MALIAN VILLAGES AFFECTED IN 2020

VILLAGE	Solar panels at school classrooms	Solar panels at health centres	Solar-powered public streetlighting	Solar-powered homework lamps	People affected
Gouakoulou	x		x	50	774
N'galafouga	x		x	50	1143
Gouenzéna	x		x	50	1145
Koumi	x		x	50	2765
Koulikoroni		x			432
N'tiobougou		x			2014
M'Pella		x			888
Sirakoro		x			989
N'Tosso	x	x	x	50	1913
Tota	5	5	5	250	12063

TABLE 2 MALI IN BRIEF

Population	20,137,527
Language	French (official), Bambara 46.3%, Peuhl/Foulfoulbe 9.4%, Dogon 7.2% (Mali has 13 official languages)
Capital	Bamako
Religion	Muslim 93.9%, Christian 2.8%, Animist 7%, none 2.5%, unspecified 2.5%
Population growth rate (annually)	2.95%
Median age	16 years
Total fertility rate:	5.63 children born per woman (4th highest rate in the world)
Infant mortality rate	62 deaths / 1000 live births (12th highest rate in the world)
Maternal mortality rate	562 deaths / 100,000 live births (15th highest in the world)
Life expectancy (total population)	62.01 years
Literacy (total population)	35.5% can read and write
GDP per capita	\$2,322 (DKK 14,222)
Population below poverty line	42.1%
Electrification – total population	50%
Electrification – rural areas	28%

Source: Central Intelligence Agency (CIA). The World Fact Book. Mali.

METHOD



SROI is a framework for understanding social and environmental value

The SROI accounts for a much broader concept of value using stakeholder evaluations to value qualitative outcomes, such as personal development, enhancement of skills, experience and well-being of stakeholders affected by a social project.

Social Return on Investment (SROI) is inspired by traditional economic approaches such as Return on Investment and Cost-Benefit analysis. The SROI is a modern method developed to quantify and understand the impact created by social projects.

The SROI was developed in 2009 by the former Office of the Third Sector (OTS) in the Cabinet Office of the UK Government¹. By measuring the economic value of social and environmental outcomes, it creates a perspective on whether a project is beneficial and profitable.

THE SROI ANALYSIS INVOLVES SIX STEPS:

- 1) **Establishing purpose and scope** of the analysis and identification of key stakeholders.
- 2) **Statement of results.** Through engaging with stakeholders, an evaluation of the monetary value of input is developed, which shows the relationship between input, output and outcomes.
- 3) **Evidencing outcomes and giving them a value.** Adding monetary value to the results.
- 4) **Establishing impact.** Having collected evidence on outcomes and monetising them, the aspects of change that would have happened anyway, or are a result of other factors, are assessed.
- 5) **Calculating the SROI.** Adding up all the benefits, comparing the result to the investment and testing the sensitivity of the results.
- 6) **Reporting, using and embedding.** Sharing findings with stakeholders and responding to them, embedding successful outcomes, processes and verification of the report.



THERE ARE TWO WAYS OF APPROACHING THE SROI:

- 1) An evaluation, which is conducted retrospectively and based on actual outcomes that have already taken place.
- 2) A forecast, which predicts how much social value will be created if the activities meet their intended outcomes.

This SROI report consists of an analysis of actual achievements, value and impact of Light over Mali in 2020, as well as a 10-year SROI ratio, which predicts the long-term effects of the project.

The purpose of employing both an evaluation and a forecast is for the SROI to provide a much broader perception of the value created, as change and development of skills evolve over time.

¹ SROI Network (2015). "A guide to Social Return on Investment". Social Value UK

STAKEHOLDERS

The SROI ratio is calculated based on the stakeholders directly and indirectly affected by the installation of solar panels in Mali.



TABLE 3 DESCRIPTION OF STAKEHOLDERS

GROUP	Effect	Included in analysis
Danske Commodities	Danske Commodities funds the entire project. No funding, no project.	Yes. Danske Commodities is included on the input side of the SROI.
Nordisk Folkecenter	Nordisk Folkecenter provides administrative services and continuous follow-up.	Yes, indirectly. Salaries are included in the input.
Children receiving homework lamps	Children living in remote locations will receive a solar lamp to help them do homework and prepare for tests after dark.	Yes. Providing homework lamps is included in the analysis.
Children in general	The village children will be able to get more school support, because teachers and classrooms are available after dark.	Yes. The enhanced educational possibilities for children in general are included.
ABE participants	The adult villagers receive education in terms of basic literacy, maths, health and contraceptive information.	Yes. The effects of ABE are included by using data from the affected stakeholders, existing scientific reports and data from the World Bank.
Children of ABE-participants	The children of the parents that attend evening classes are believed to get enhanced support from home to continue schooling, spend time on homework, etc.	No. It is difficult to estimate a monetary value of these spill-over effects, even though the World Bank documents that ABE affects children in a positive manner.
Teachers	Education after dark would not be possible without solar panels or teachers and classrooms.	Yes. To establish a broader picture of the value created, we have included the teachers' perception of the effects.
Local solar panel technicians	Local villagers receive fundamental education in installation and maintenance of the solar panel systems.	Yes. Because training local technicians is a prerequisite for keeping the solar panels up and running.
Personnel at health clinics	The solar panels at the health clinics help the personnel treat diseases, keep medicine cool and prevent women and babies from dying during childbirth, because the medical facilities are fully operational after dark.	Yes. The health clinics are included. Enhancing productivity by reducing sickness among the workforce would not be possible without medical personnel or medicine.
Villagers in general	The health clinics can treat more patients and provide better care after dark, which reduces illness and enhances general well-being. Also, having lamp posts in city centres enhances safety.	Yes. As the number of sick days are minimised, the village population can work more often, and this will affect their level of income. And the increased safety minimises the risk and worries about crime at night.

DATA

Different perspectives are an important aspect of the complete analysis as well as the validity of the information.

An SROI analysis has three data entry points: input, output and outcome. Output and outcome data are based on interviews with the different stakeholder groups affected by solar panels installed in Mali and interviews are conducted by combining open-ended qualitative questions and close-ended quantitative questions.

Furthermore, data is derived from quantitative data¹ from the World Bank, insights from both Mali Folkecenter and Nordisk Folkecenter and scientific research papers, including an evaluation conducted by the Norwegian Agency for Development Cooperation² and a systematic academic review, Returns to Investment in Education by educational scholars George Psacharopoulos and Harry Patrinos³.

A part of the data is derived from HACT's Social Value Bank – the largest set of methodologically consistent social value metrics produced, including 636 well-being valuations⁴. The outcome in terms of well-being effects is based on research from HACT.

To ensure that the well-being effects of Light over Mali can be compared across economies of the world, purchasing power parity (PPP) adjustments are made throughout the calculations. PPPs are calculated by

collecting and analysing data on the prices of the same goods and services across many economies and measuring what the price of an item is in one country relative to another⁵.

RESEARCH AND DATA LIMITATIONS

Improvements in the quality of life, feelings and well-being of individuals are very difficult to estimate. The SROI analysis attempts to measure this by asking stakeholders how they themselves value the change, i.e. how important it is to them and how it has changed their lives. Furthermore, the collected data contains uncertainty factors like social desirability bias, which occurs when respondents answer questions in a manner that will be viewed favourably by others, because of the norm or simply a natural wish to depict success⁶. There are also challenges linked to determining an appropriate discount rate as well as considering potential risk factors when projecting values into the future forecasting of impacts after five or 10 years.

QUOTES

"During the night, we can now help with infusions, minor surgeries and childbirth. The darkness is broken, the ease of work, the safety of the centre, encouragement of the women to make the visits. Overall, being able to receive treatment at night has created confidence and assurance for the population"

- Health clinic personnel, 40 years old

"The electricity has positively affected our ability to treat patients. We don't worry about the light during the night, it eases our work and eliminates the difficulties of handling the phone torch. We are able to treat more people during night, which has reduced the number of illnesses because the patients no longer wait for the day to come"

- Health clinic personnel, 38 years old



"With the solar lamps, I can prepare my homework in the evenings. Since receiving the homework lamps, I learn better, my knowledge has improved, and I have more courage"

- Student, 14 years old

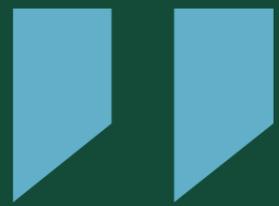
"I have a good grade now and I am at the top of my class. With the abundant light, I learn more and I can do my homework with less trouble. I have also made use of the classrooms with light to do exercises"

- Student, 13 years old

"The supply of homework lamps and lightning of the classrooms is very beneficial and advantageous. It improves the school children's learning, know-how, progress, grades and gives them a better chance to continue their studies"

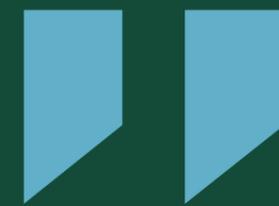
- Teacher, 55 years old

- 1 Lauglo, Jon. 2001. Engaging with adults: the case for increased support to adult basic education in Sub-Saharan Africa. Africa region human development working paper series; Africa regional educational publications. Washington, DC: World Bank.
- 2 Education for Development, Norway
- 3 Psacharopoulos, George and Harry Anthony Patrinos, World Bank
- 4 HACT (2019). Social Value Calculator.
- 5 <http://datatopics.worldbank.org/world-development-indicators/stories/adjusting-for-price-differences-across-the-world.html>
- 6 https://www.researchgate.net/publication/229526508_Methods_of_Coping_With_Social_Desirability_Bias_A_Review



With the solar lamps, I can prepare my homework in the evenings. I learn better, my knowledge has improved, and I have more courage

Student, 14 years old



The supply of homework lamps improves the school children's learning

Teacher, 55 years old



During the night, we can now help with infusions, minor surgeries and childbirth. The darkness is broken.

Health clinic personnel, 40 years old

CALCULATIONS

A detailed description of the calculations for the input, output and outcome of the evaluation and forecast is provided in the following section.

INPUT

Input is defined as the total amount of resources used to operate the project for a given period – in this case 2020. The input consists of Danske Commodities’ donation of DKK 200,000.

OUTPUT

The output is a quantitative statement of the number of activities and people involved in Light over Mali in 2020.

Energy production

One output aspect is energy production – specifically the amount of light generated by the solar panels. Each solar panel generates the following amount of energy:

- Solar panels for one school: light up two classrooms for four hours per day
- Solar panels for one health clinic: light up the clinic for nine hours per day
- Solar panels for one lamp post: light up the public square for eight hours per day
- Solar-powered homework lamps: generate light for eight hours per day on a low light setting and four hours on a high light setting

For the villages overall, the solar panels installed at schools, health clinics and for public streetlights can generate 105 extra hours of light per day. Adding 250 solar-powered homework lamps that run on the high light setting to the equation, the solar panels can generate a total of 1105 hours of light per day. In a year, the panels produce more than +400,000 hours of extra light combined for the villages.

EXPERIENCED IMPACT

The output also consists of the qualitative and quantitative statements of the people impacted by the project, as several stakeholder groups have experienced a number of different effects.

Furthermore, the effects of education and access to health treatments after dark make up a large part of the SROI ratio, as light is the prerequisite for the two.

OUTCOME

The outcome is the effect the project has had on the stakeholders. The outcome falls in two parts: an evaluation of the project’s effect in 2020, followed by a forecast of the project after a 10-year period.

OUTCOMES OF THE EVALUATION

In 2020, it was a priority to help the broader community of Mali. Therefore, we have been able to help nine different villages and approximately 12,000 people in total. Previously, the project focus has been to conduct ABE in the evenings, but it was not possible to conduct ABE in 2020 due to deficient infrastructure and a lack of local ABE teachers in the decentralised villages. However, all the solar panels have been installed and some of the villages might offer ABE at a later point, because they now have the facilities to do so. Instead, priority was given to health and safety, education of local solar technicians and to improving the educational conditions for children both at local schools and at home.

TABLE 4 OUTCOMES OF THE EVALUATION OF 2020

OUTCOME TYPE	Description of outcome	Value
Reducing sickness	The health clinics with solar panels can treat more patients and provide better care after dark, which reduces illness and enhances general well-being. In relation to the Social Value Bank, the effect of good overall health is included in the calculation.	DKK 179,015
Educating local technicians	Training 10 local villagers in installing and maintaining the solar panel systems provides them with a very useful craft, which gives the local technicians better access to the job market – which is characterised by a lack of qualified, skilled technicians to meet the growing demand for off-grid solar power installations. In relation to the Social Value Bank, the effects of general job training and confidence are included in the calculation.	DKK 52,680
Increasing safety	The five lamp posts installed in city centres minimise the risk of people becoming a victim of a crime or an animal attack at night. In relation to the Social Value Bank, the effect of not being worried about crime is included in the calculation.	DKK 112,583
Children receiving homework lamps	250 school children living in remote locations have each received a solar-powered homework lamp, which among other things has improved their school and social life as well as their grade averages. In relation to the Social Value Bank, the effect of improved confidence is included in the calculation.	DKK 137,514
Children using classrooms in the evening	About 1000 school children from the five villages with solar panels installed at the schools use the classrooms at night to do homework and prepare for tests. In relation to the Social Value Bank, the effect of improved confidence is included in the calculation.	DKK 165,016
TOTAL OUTCOME	All stakeholders	DKK 646,808



A number of deductions have been carried out throughout the calculations above, because some stakeholder groups only experience a part of the well-being effects and with different levels of intensity. Moreover, to present the most accurate estimate possible when calculating the effects and to isolate the impact of Light over Mali, the aspects of deadweight, displacement and attribution are taken into account in the calculations.

Deadweight is the change that would have happened anyway without the donation. In this project, the deadweight is estimated to be 20%. Displacement looks at whether the social change displaced something else or has unintended consequences. This is expected to be very low. Attribution acknowledges that some of the created value can be attributed to others – which is the aspect that generates the most substantial deductions in this report, i.e. by 50% to 90%. It is recognised that enhancing productivity by reducing sickness among the workforce will not happen without medical personnel or medicine. Education after dark will not be possible without solar panels; nevertheless, education will be impossible without teachers and classrooms. These elements are also deducted from the value. The drop-off effect is presented in the calculations of the forecast below.

Outcomes of the forecast

A forecast is an attempt to project the future value of all the outcomes achieved in the evaluation. The 10-year forecast predicts a total net present value of DKK 14,464,268. The forecast is based on a donation of DKK 200,000 from year 2018-2020 and a donation of DKK 150,000 from year 2021-2027, allocated to new villages with new participants. All investments continuously generate output but with a year-on-year drop-off effect

of 10%. The forecast is discounted using a discounted cash flow (DCF) analysis, entailing that the time value of money is considered. In the model, a 4% return on capital has been used.

CALCULATING THE SROI RATIO

The SROI ratio is calculated by dividing the value of the net output by the value of the net input.

$$\frac{\text{Output}}{\text{Input}} = \text{SROI ratio}$$

The SROI ratio is a metric that shows how much value is generated in DKK for every DKK 1 of value put into the project. The ratio falls in two parts: one for the evaluation, where the ratio shows the immediate value created, and one for the forecast which estimates the value creation after 10 years.

EVALUATION

The total input spent on the project is DKK 200,000 and the output is calculated at DKK 646,808. Therefore, the SROI ratio is 3.23, as shown below. This means that for each DKK 1 spent on Light over Mali, DKK 3.23 was generated for 2020.

$$\frac{\text{Output}}{\text{Input}} = \frac{646,808}{200,000} = 3.23 = \text{SROI ratio}$$

FORECAST

If we look at the 10-year forecast, the net spending of Light over Mali sums to DKK 1,355,389 and the total net output sums to 14,464,268 DKK.

$$\frac{\text{Output}}{\text{Input}} = \frac{14,464,268}{1,355,389} = 10.67 = \text{SROI ratio}$$

TABLE 5 FUTURE CASH FLOWS (DKK)

	1	2	3	4	5	6	7	8	9	10
Group 1	595,471	535,924	482,332	434,098	390,689	351,620	316,458	284,812	256,331	230,698
Group 2		649,746	584,772	526,295	473,665	426,299	383,669	345,302	310,772	279,695
Group 3			433,362	390,025	351,023	315,921	284,329	255,896	230,306	207,275
Group 4				433,362	390,025	351,023	315,921	284,329	255,896	230,306
Group 5					433,362	390,025	351,023	315,921	284,329	255,896
Group 6						433,362	390,025	351,023	315,921	284,329
Group 7							433,362	390,025	351,023	315,921
Group 8								433,362	390,025	351,023
Group 9									433,362	390,025
Group 10										433,362
TOTAL	595,471	1,185,670	1,500,465	1,783,780	2,038,763	2,268,249	2,474,785	2,660,668	2,827,963	2,978,528



TABLE 6 DISCOUNTED CASH FLOW ANALYSIS (4%)

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Investments	-200,000	-200,000	-200,000	-150,000	-150,000	-150,000	-150,000	-150,000	-150,000	-150,000
Total Output	595,471	1,185,670	1,500,465	1,783,780	2,038,763	2,268,249	2,474,785	2,660,668	2,827,963	2,978,528
Net Cash Flow	395,471	985,670	1,300,465	1,633,780	1,888,763	2,118,249	2,324,785	2,510,668	2,677,963	2,828,528
Present value of Net Cash Flow	380,261	911,308	1,156,109	1,396,562	1,552,426	1,674,083	1,766,646	1,834,521	1,881,501	1,910,852

SENSITIVITY ANALYSIS

The forecast is based on assumptions – and with assumptions come uncertainties. This section presents different sensitivity analyses that examine how changes in the assumptions affect the SROI ratio. This gives an idea of the ratio’s sensitivity in different scenarios.

SENSITIVITY ANALYSIS GOOD OVERALL HEALTH

% EXPERIENCING FULL EFFECT	0%	4%	8%	11%	15%	19%	23%	26%	30%
SROI	2.34	2.56	2.79	3.01	3.23	3.46	3.68	3.91	4.13

SENSITIVITY ANALYSIS NOT WORRIED ABOUT CRIME

% EXPERIENCING THE FULL EFFECT	0.0%	0.1%	0.3%	0.4%	0.5%	5.0%	10.0%	15.0%	20.0%
SROI	2.67	2.81	2.95	3.09	3.23	8.30	13.93	19.56	25.19

SENSITIVITY ANALYSIS IMPROVEMENTS IN CONFIDENCE (CHILDREN RECEIVING HOMEWORK LAMPS)

% EXPERIENCING FULL EFFECT	0.0%	2.5%	5.0%	7.5%	10.0%	12.5%	15.0%	17.5%	20.0%
SROI	2.55	2.72	2.89	3.06	3.23	3.41	3.58	3.75	3.92

SENSITIVITY ANALYSIS IMPROVEMENTS IN CONFIDENCE (SCHOOL CHILDREN)

% EXPERIENCING FULL EFFECT	0.0%	1.3%	2.5%	3.8%	5.0%	8.8%	12.5%	16.3%	20.0%
SROI	2.41	2.62	2.82	3.03	3.23	3.85	4.47	5.09	5.71

SENSITIVITY ANALYSIS GENERAL JOB TRAINING (TECHNICIANS)

% EXPERIENCING FULL EFFECT	0.0%	18.8%	37.5%	56.3%	75.0%	81.3%	87.5%	93.8%	100.0%
SROI	3.16	3.18	3.20	3.22	3.23	3.24	3.25	3.25	3.26

SENSITIVITY ANALYSIS HIGH CONFIDENCE (TECHNICIANS)

% EXPERIENCING FULL EFFECT	0.0%	12.5%	25.0%	37.5%	50.0%	62.5%	75.0%	87.5%	100.0%
SROI	3.04	3.09	3.14	3.19	3.23	3.28	3.33	3.38	3.43

The sensitivity analysis shows that a decent SROI ratio is sustained even in worst-case scenarios. If the ratio is to diminish, several of the above scenarios should deteriorate at the same time, which is unlikely. Moreover, the analysis shows that it is possible to achieve an even higher positive outcome in the future.



ADDITIONAL VALUE CREATION

Light over Mali creates more long-term value than measured in the analysis – value that is difficult or nearly impossible to measure. The following section presents additional value created by the project, based on knowledge from the World Bank, scientific research papers and insights from both Mali Folkecenter and Nordisk Folkecenter.

01

Modernising rural areas help provide the pull needed to keep young people in the local communities instead of them migrating to large cities, thus strengthening the rural economy.



03

The health clinics help save women, and especially babies, from dying during childbirth.



04

As children's study hours increase, one can expect they will have higher school attendance and eventually a higher grade completion, which might also result in a higher future income.

02

Patients having a surgery or giving birth, don't need to be stressed about whether it will be in darkness. Evacuations to villages with better facilities can be also avoided, which increase safety as local road and transportation conditions are not always good.

06

The installed solar panels make it possible for villagers to recharge their cellular phones at the schools, easing the communicative infrastructure.



05

With higher-quality lighting, household members can be expected to engage in a wider range of activities e.g. socialising, reading, household tasks and productive activities, such as handicrafts, more efficiently and safely.



07

The public streetlights will heighten security after dark, minimising the risk of theft, and help the villagers avoid dangerous animals during the night. With light people can meet there any time they wish, which has a big impact on the quality of life.



08

Local men and women given basic training in electricity and solar panels can utilise their newly acquired skills elsewhere, giving them access to the broader job market in Mali.

CONCLUSION

In 2020, Light over Mali created tangible value for more than 12,000 people in nine rural Malian villages. The value is created by bringing electricity to un-served areas in Mali and generating +400,000 hours of light annually by placing solar panels at schools, health clinics and in lamp posts and giving school children homework lamps.

The new sources of light give the villages new opportunities after dark. The schools are available for educational purposes after dark and villages can offer basic education to the adult population, children can use the classrooms during the evenings and the homework lamps enable children living in remote locations to study after dark.

The public streetlights enhance safety and help sick people find their way to the health clinics at night. Also, the clinics can treat more patients and help deliver babies safely. Last, but not least, technical training in solar energy installation and maintenance are provided to local villagers, which is a prerequisite for keeping the solar panels up and running.

Based on an evaluation of the project in 2020, the SROI ratio is calculated at 3.23. Over a 10-year period, the SROI ratio is 10.67. This means that for each DKK 1 spent, DKK 10.67 is generated over 10 years.

The values achieved are based on educational programmes and access to medical assistance, increasing the knowledge, health, productivity and general well-being among the villagers.



SOLAR PANELS

installed on schools, health clinics and lamp posts



LIGHT WHEN IT'S DARK

extended days



HEALTH

Improved treatment conditions
Decreased sickness
Reduced infant mortality
Lowered childbirths



EDUCATION

Improved living standard
Increased income-levels
Empowered entrepreneurship
Redressed power imbalances

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Photo credit: Mali-Folkecenter Nyetaa



APPENDIX 1: IMPACT MAP

STAKEHOLDERS	STEP 1	STEP 2			STEP 3		NO. OF STAKEHOLDERS	STAKEHOLDERS EXPERIENCING EFFECT	TYPE OF INDICATOR	VALUE PER UNIT GBP	YEARLY GROSS VALUE (DKK) PPP ADJUSTED	STEP 4				STEP 5
	CHANGE	INPUT	OUTPUT	OUTCOME	INDICATOR	SOURCE						DEAD WEIGHT	DISPLACEMENT	ATTRIBUTION	DROP OFF	NET VALUE
Health clinic patients	Reducing sickness	Donation DKK 200,000	Solar panels at five health clinics	Ability to treat more patients, keep medicine cool and provide better care	Good overall health	HACT (2014)	100	15%	Social Value from Social Value Bank	€ 20.141	895.076 kr.	20%		75%		179.015 kr.
Villagers in general	Increasing safety		Five lamp posts in city centres	Minimised risk of being a victim of a crime or an animal attack at night	Not worried about crime at night	HACT (2014)	7740	0,5%	Social Value from Social Value Bank	€ 12.274	1.407.293 kr.	20%		90%		112.583 kr.
Children receiving homework lamps	Enabling homework and preparation for exams		250 solar-driven homework lamps	Improved school and social life	Improvements in confidence	HACT (2014)	250	10%	Social Value from Social Value Bank	€ 9.283	687.568 kr.	20%		75%		137.514 kr.
School children in general	Enabling homework and preparation for exams		Solar panels at five schools	Improved school and social life	Improvements in confidence	HACT (2014)	1000	5%	Social Value from Social Value Bank	€ 9.283	1.375.136 kr.	20%		85%		165.016 kr.
Solar panel technicians	Improving skills		Training of local technicians	Improvement of skills	General job training	HACT (2014)	10	75%	Social Value from Social Value Bank	€ 1.567	34.819 kr.	20%		50%		13.928 kr.
					Increased belief in themselves, because the villages rely on their skills to keep the solar panels up and running.	High confidence	HACT (2014)	10	50%	Social Value from Social Value Bank	€ 13.080	193.760 kr.	20%		75%	

APPENDIX 2: ASSUMPTIONS AND MEASUREMENT UNCERTAINTIES

The analysis is based on a number of assumptions and factors that affect the conclusion. This table describes these assumptions and explains how they can affect the results of the analysis.

POSITIVE EFFECTS ▲

Number of affected stakeholders

The annual number of people affected by the project is approx. 12,000. If the number is higher next year, this would have a favourable effect on SROI.

Well-being effects

If the well-being effects in the evaluation are underestimated, the outcome and the SROI ratio will be higher than reported.

Long term effects

We estimate that each villager receiving education will have an increased salary for ten years. This number could be significantly higher and thus have a positive effect on the SROI ratio.

Sickness

We estimate that the average amount of absence days of each member of the workforce will be reduced by one day, because of improved knowledge about health and treatment conditions after dark. This number could possibly be higher, which would have a positive effect on SROI.

Other value creation

If other value creation could be measured, this would have a positive effect on the SROI ratio.

NEGATIVE EFFECTS ▼

Number of affected stakeholders

If the number of affected stakeholders is lower, it will have a negative effect on the SROI ratio.

Well-being effects

If the well-being effects in the evaluation are overestimated, the outcome and the SROI ratio will be lower than reported.

Long term effects

We estimate that each villager receiving education will have an increased salary for ten years. This number could be lower and thus have a negative effecting on the SROI ratio.

Education

We estimate the effects of ABE, but we do not know how great an impact the teaching has. Poor educational quality could have a negative effect on the SROI ratio.

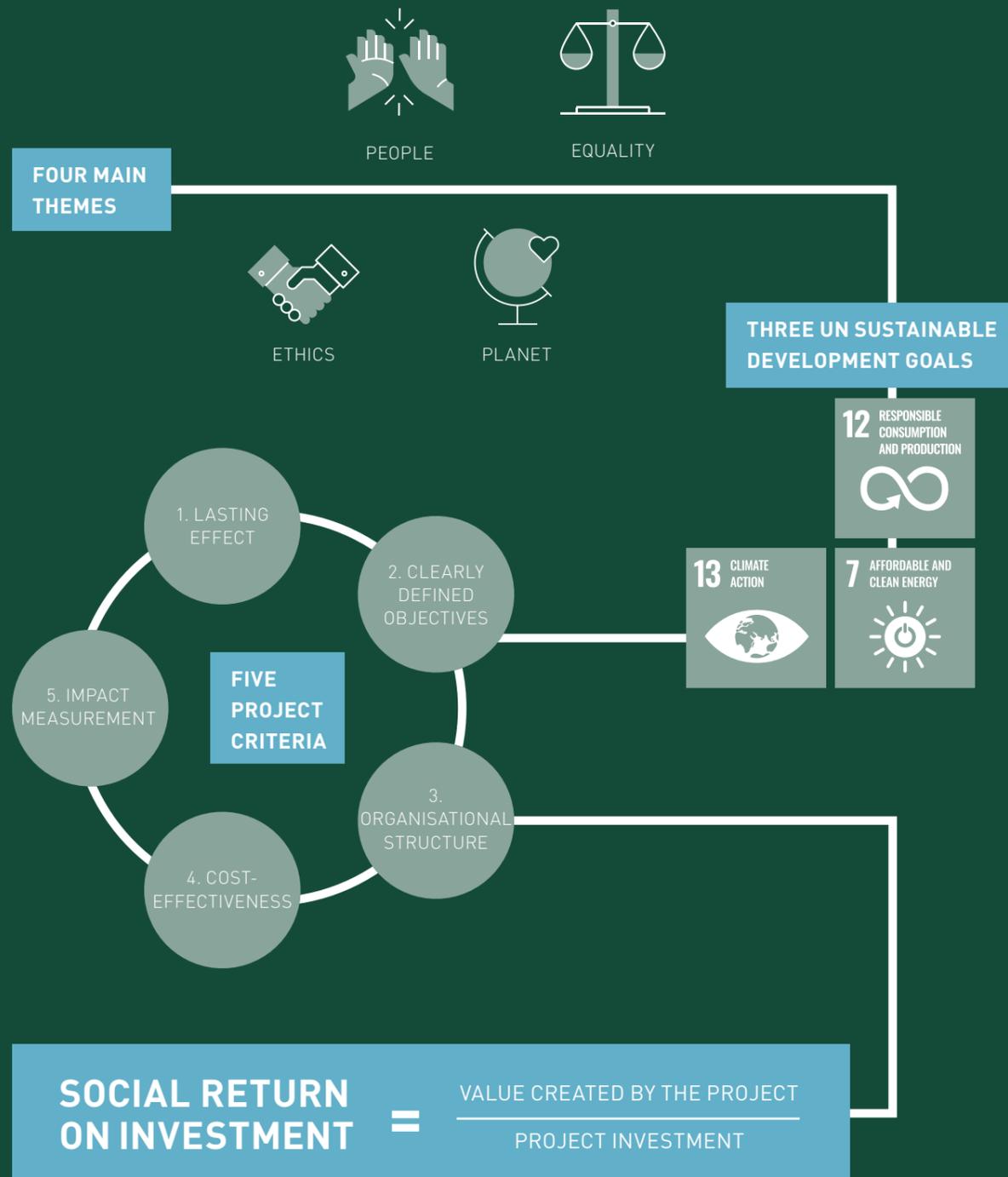
Deadweight and drop-off

In this project, the deadweight is estimated at 20% and the year-on-year drop-off effect is estimated at 10%. If the deadweight and drop off turn out to be higher in the future, the SROI ratio will be lower than estimated in the analysis.



OUR APPROACH

We strive to create long-term growth for the company while at the same time supporting the ongoing development of a more efficient, transparent and economically-viable energy market. Supported by our vision of trading for an efficient tomorrow, we employ a Corporate Social Responsibility approach covering different levels of project criteria.





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