

2021

Climate Actions of LONGi



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01 Forewords

LONGi Green Energy Technology Co., Ltd. (Abbreviated as “LONGi Group” or “LONG”) was founded in 2000. Over the past two decades, LONGi has continuously supplied the high-quality, efficient, economical green and renewable energy solutions to the customers, and it has persistently practiced company development concept of green and low-carbon. At the 24th United Nations Climate Change Conference in 2018, LONGi launched the “**Solar for Solar**” concept and committed to achieving Zero Carbon emissions across the entire photovoltaic industry chain.

In 2020, LONGi joined RE100, EP100, and EV100 initiatives, becoming the first company in China to join all three climate organization “100” initiatives, and it has joined the Science Based Targets initiative (SBTi) in the same year in response to the CDP climate change questionnaire. All these starts the climate actions of LONGi:

RE100—committed to power its global operations by 2028 with 100% renewable electricity.

EP100—committed to installing Energy Management System (EnMS) for all operational locations by 2025, improving energy productivity by 35% on basis of that in 2015.

EV100—committed to installing sufficient charging facilities for electric vehicles in the next ten years, steering employees to convert into electric vehicles.

SBTi — to set a Greenhouse Gas (GHG) emission reduction target of the company aligned with the 1.5-degree temperature goal scenario.

On the occasion of the 26th United Nations Climate Change Conference of the Parties in Glasgow, the UK, LONGi had released its 2021 action report responding to climate change, demonstrating its climate actions for fulfillments of the enterprise commitments in practices, and its efforts towards the sustainable development goals.

China General Certification Center (CGC) had supported the company for this report and verified it.



02 Speech from Management TEAM



In the long development course of before the industrializations, our ancestors coexisted in harmony with nature by their wisdom and they had continued the ancient civilization generations by generation. Of the moment, extreme weathers are frequently reported globally while the climate crisis is pressing to the human being. We had never confronting such an ecological crisis in the globe scale. How many of the Earth citizens would able to be supported for their habitations?

Fortunately, we have being reflecting on the consequences from our behaviors and seeking a scientific path to save our planet. Since the Earth is the sole habitation place for us, a revolution is require to evolve the Earth to a beautiful one with ecological civilizations by forming the green development approach and the new fashion of lifestyles.

The *Paris Agreement* steers the world into a green and low carbon transition, which becomes the guidance for minimum actions we need to take to protect our home. As the goals of carbon

neutrality have been set up on basis of a global consensus for actions, the substitution process by renewable energies has been deemed as an important and critical step in fighting climate change. In past decade, Photovoltaic industry has witnessed a unprecedented and tremendous development in China, featured with rapid technology advancements and low cost while the solar product performances had been improved dramatically. The clean energy is easier accessible with lower price now, which turns the “Solar + Energy Storage+ Green Hydrogen” into a powerful tool against climate change.

LONGi has always contribute to the global economy development of low carbon and climate goals. We proposed the concept of “**Solar for Solar**” at the 24th United Nations Climate Change Conference. In 2020, the COVID-19 pandemic swept the world, but it did not stop LONGi for its climate actions. LONGi is the only Chinese company joined in international initiatives of **RE100, EP100, EV100 and SBTi**. In 2020, we released the first “**Zero Carbon Plant**” plan.



LONGi surely understands that its long term pursuit of “Zero Carbon” facing obstacles since these initiatives will span 1 to 2 decades, even a longer period. Actions in this pursuits involves all departments and all working steps in LONGi, and all these are the common perceptions and desires of all employees working in LONGi. We dream to remove carbons from the solar production process. LONGi wishes to set a successful example to the others with its “Produce clean energy with clean energy” action. Perception of LONGi on the eventual purposes of the four initiatives is that all entirities should take mandatory actions against climate changes and the earlier deployments of the business able to steer renewable industry and lead in its development.

LONGi looks forward to collaborate with more partners and stakeholders, the upstream and downstream enterprises in the supply chain are in particular for actions with consensus. Adhering to the consensus on values, LONGi will let the partners and stakeholders understand what LONGi is working for, and what contributions should be made to the solar industry to meet the

social demands. We believe that most suppliers of LONGi is able to understand, recognize, support, collaborate with us and make the progress with LONGi for a brighter industry through such a common undertaking.

We believe if all governments, enterprises, and the private forces able to move forward jointly, we are definitely able to defeat the climate change and contribute to the sustainable development of the human being greater. Let the light of ecological civilizations illuminate the way ahead!

Founder & President of LONGi

03 Achievements Brief

In the context of China's goal of “reaching carbon peak by 2030 and striving to achieve carbon neutrality by 2060”, as a leader in the new energy industry and a leader in green and low-carbon development, LONGi actively implements four international initiatives to fulfill our commitments, and it had made outstanding achievements:

Within the operational boundary (Scope 1&2)
2,573,016
t

Completed GHG emission calculation and verifications on the entire value chain. Within the operational boundary (Scope 1&2), emissions are 2,573,016 t CO₂e in 2020, and value chain emissions (Scope 3) are 20,920,503 tCO₂e in 2020.

Value chain emissions (Scope 3)
20,920,503
t

Operates with RE100
5
Plants

5 plants in Yunnan operates with 100% RE in 2020

Equivalent to reducing GHG emissions of about
1,356,216
t

Continually implemented RE100 initiative, the RE percentage of LONGi in 2020 is 41.83%, equivalent to reducing GHG emissions by about 1,356,216 tCO₂e

The energy productivity has been improved by
49.77%

Continually implemented EP100 initiative, by the end of 2020, 4 out of 28 operational locations have been installed EnMS, the energy productivity has been improved by 49.77% from the 2015 level

50
charging infrastructures have been installed

Continually implemented EV100 initiative, 50 charging infrastructures have been installed in 5 out of 29 company operational sites (including the head office).

Based on the future development plan, **LONGi finalized its goals for Science Based Targets initiative (SBTi)** :

- By 2030, the GHG emissions within the operational boundary reduce by 60% from the 2020 level.
- The carbon footprint of silicon materials, cells, and glass should be reduced by 20% compared to that of the 2020 level.

04 RE100、EP100 and EV100

1. RE100 Achievements

LONGi joined the RE100 initiative in 2020 and promised to achieve 70% renewable electricity consumption ratio by 2027 and 100% by 2028. According to the *RE100 Technical Criteria*, LONGi's **renewable electricity usage percentage in 2020 is 41.83%**. The RE100 Technical Criteria provides 7 options to use renewable electricity. In 2020, three of them are adopted by LONGi for renewable energy as below:

1. Company owned and operated generation facilities

LONGi Taizhou module and cell plants had installed solar power stations on rooftop with capacity of 10.2MW and 3.77MW respectively, and New Energy Business Unit in this Company operates and owns these stations. Requirements in *RE100 Technical Criteria* is complied.

2. Purchase RE from on-site generation owned by third party

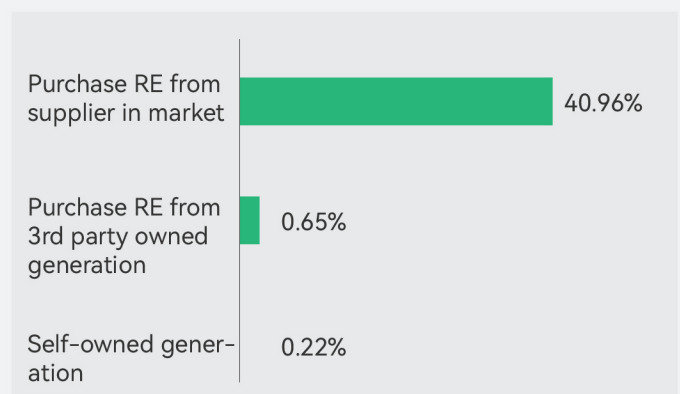
Third-party-owned power stations have been installed in Xi'an Wafer plant (0.95MW), Yinchuan LONGi Solar Phase I facility site (2.25MW), Wuxi LONGi plant (1.2MW), and Xi'an module plant (1.3MW) respectively. LONGi purchases RE from the owner of these stations through contracts to meet requirements of *RE100 Technical Criteria*.

3. Purchased RE from the supplier in the market

By purchasing RE from the regional electricity market, 5 plants in Yunnan Province operates with 100% RE in 2020 to meet requirements of *RE100 Technical Criteria*. Sources of these power can be tracked and verified through these contracts.

The following diagram depicts RE consumption status of LONGi in 2020, which shows that LONGi had RE purchased mainly from the market in 2020.

Structure of RE sources



Picture 4-1 Structure of RE sources of LONGi in 2020

04 RE100、EP100 and EV100

2. EP100 Achievements

LONGi joined the EP100 initiative in 2020, committed to install Energy Management System (EnMS) for all operational sites by 2025, and improve renewable energy ratio by 35% from the 2015 level.

As by 2020, **4 out of 28 production sites under LONGi Group had installed EnMS**. Comprehensive power utilization efficiency in LONGi had been improved by 49.77% on the 2015 baseline, and the company had attained its energy efficiency goal ahead of the schedule according to the calculations completed by China General Certification Center for the company on basis of Corporate Accounting and Reporting Standard by GHG Protocol as well as energy related national laws, regulations and standards.

3. EV100 Achievements

LONGi joined the EV100 initiative in 2020, committed to install vehicle charging facilities in all operational sites by 2030.

As by end of June 2021, **5 out of 28 production sites (include the head office) under LONGi Group had installed 50 charging facilities**, including 41 7kW AC charging cables and 9 40kW DC charging cables. China General Certification Center had finished its calculations for all these in production bases and office area of LONGi under the related national laws, regulations and standards for energy and electronic vehicles.

05

Science Based Targets initiative (SBTi)

Science Based Targets initiative (SBTi) is a international initiative initiated by CDP, WRI, WWF, and UNGC jointly. It is intended to encourage various of the enterprises to define goals to reduce greenhouse gases with the scientific outlook so as to contain the average temperature increasing across the globe within 2°C of the pre-industrial level, and keep the 1.5°C within reach by closing of this century.

A practical goal has been set eventually to comply with production and operation realities and the green development determinations of LONGi Group on basis of its 5 to 10-year development plan, the policy and market environment, and the reasonable emission and reduction opportunities and potentials after the accurate calculations to the GHG emissions in the organization level to the company.

1. GHG Calculation Results

Calculation standard for GHG emissions in LONGi in 2020 had been defined by referring to the business features, operation realities and commercial purposes of this project as below:

- Corporate Calculation and Reporting Standard by GHG Protocol GHG Protocol
- Corporate Value Chain Calculation and Reporting Standard by GHG Protocol GHG Protocol
- IPCC 2006 and its revisions in 2019
- National laws, regulations, standards, year-books related to GHG emission



1.1 Accounting of Scope 1&2

Judgement basis from related standards for emission categories for scope 1&2 and categories excluded in these calculations could refer to the table below:

Table 5-1 Emissions Category Identifications under Scope 1&2

Emission Category	Included/ Excluded	Judgement basis
Combustion of fossil fuel	Included	
Direct emissions from production process	Included	
Leakage of refrigerants	Included	
Leakage of fire extinguishing facilities	Excluded	minimum quantity
Emissions from wastewater treatment	Excluded	No GHG from wastewater treatment within operational boundary
Outsourced electricity	Included	
Outsourced thermal power	Included	

After calculation, emission quantity under scope 1&2 in LONGi in 2020 is 2,573,016 tCO₂e, with the following distributions:

Scope 1 emissions: 92,665 tCO₂e (3.60%)
Scope 2 emissions: 2,480,349 tCO₂e (96.40%)

05
Science Based
Targets initiative (SBTi)

1.2 Accounting of Scope 3

Judgement basis from related standards for emission categories for scope 3 and categories excluded in these calculations could refer to the table below:

Table 5-2 Emissions Category Identifications under Scope 3

Emission Category	Included/Excluded	Judgement basis
Purchased goods and services	Included	
fixed assets	Excluded	unrelated to the business goal
Fuel and energy-related activities upstream	Included	
Upstream transportation & distribution	Included	
Waste generated in operations	Included	
Business travel	Excluded	minimum quantity
Employee commuting	Excluded	minimum quantity
Upstream leased assets	Excluded	Not applied, no such emission related activity identified
Downstream transportation & distribution	Included	
Products reprocessing	Excluded	Not applied, no such emission related activity identified
Use of sold products	Excluded	Not applied, no such emission related activity identified
obsolete products processing	Included	
Downstream leased assets	Excluded	Not applied, no such emission related activity identified
Franchises	Excluded	Not applied, no such emission related activity identified
Investments	Excluded	Not applied, no such emission related activity identified

After calculation, the overall emissions under Scope 3 in LONGi in 2020 are 20,920,503 tCO₂e, with the distributions as below:

Table 5-3 Scope 3 Emissions Calculation Results

Emission Category	Emissions Quantity (tCO ₂ e)	Percentage
Purchased raw materials and services	20,314,408	97.10%
Fuel and energy-related activities	82,162	0.39%
Upstream transportation & distribution	353,090	1.69%
Waste generated in operations	2,848	0.01%
Downstream transportation & distribution	163,437	0.78%
End-of-life treatment of sold products	4,558	0.02%
Total	20,920,503	



05 Science Based Targets initiative (SBTi)

2. Methods Setting Approach

Methods and procedures of target setting can refer to below:

- Map emission curves with minimum requirements from SBTi according to its requirements.
- Forecast development scenarios according to the operation forecast and energy-saving (assumed conditions) plans. Estimate trends of emission changes on basis of actuals in 2020.
- To Identify the minimum relevance for missions in different scenarios with minimum SBTi requirements and specify the rational goals for emission able to meet SBTi requirements.
- Set carbon peak and neutrality goals in a prudent principle on basis of the goals set in a scientific manner.

3. SBTi Minimum Requirements

The minimum SBTi requirements will be as below on basis of actual GHG emissions of LONGi in 2020,

Scope 1&2 (1.5-degree scenario):

LONGi emission reduction pathway under 1.5 degree scenario

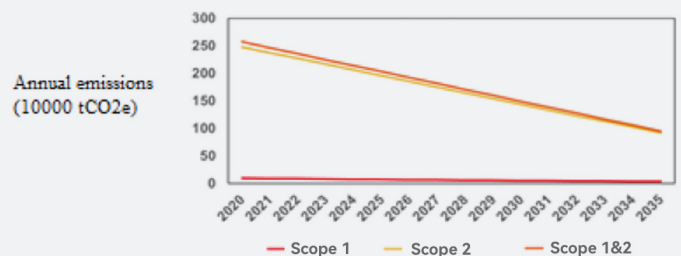


Figure 5-1 Emission Volume Forecast (Scope 1&2)

Scope 3 (absolute value based, 1.5 - 2-degree scenario)

Section 2. Absolute Contraction Approach

	Base year (2020)	Target year (2030)	% Reduction
Company Scope 3 emissions - 2C (tCO2e)	20,920,503.3	18,347,281.4	12.3%
Company Scope 3 emissions - WB2C (tCO2e)	20,920,503.3	15,690,377.5	25.0%
Company Scope 3 emissions - 1.5C (tCO2e)	20,920,503.3	12,133,891.9	42.0%

Figure 5-2 Emission Volume Forecast (Scope 3)

05 Science Based Targets initiative (SBTi)

4. Scenario Prediction

According to internal development plans, PV industry development trend, and market share forecasts, the GHG emissions of LONGi under optimistic and conservative scenarios by 2030 are predicted as below:

In setting process of the carbon emission goals in LONGi Group, the curve for optimistic and pessimistic carbon emission volumes for LONGi Group in 2030 can refer to below, which had been finished on basis of the internal development plan, the overall solar industrial trends as well as the market share forecast of the company:

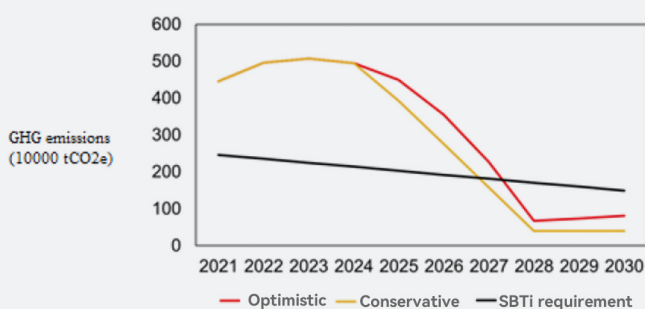


Figure 5-3 Emission Forecast under Scope 1&2

From the above predictions that if the RE100 target will be fulfilled in 2028, even no other GHG emission control measures are taken, the total emissions under Scope 1&2 in 2030 will be reduced by 84.3% and 68.6% respectively under the pessimistic and optimistic scenarios, compared with that in 2020.

5. LONGi SBTi Target

With above analyses, LONGi has set its SBTi targets as below:

- By 2030, the GHG emissions within the operational boundary is scheduled to reduce by 60% from that of the 2020 level.
- The carbon emissions of silicon material, cell, and glass will be reduced by 20% compared with that in 2020.

As required by the organization of SBTi, the above targets will be reviewed and approved before the official release.



06 Future Actions

LONGi's business and operation situations determine our GHG emission characteristics that major consumptions under of Scope 1&2 come from electricity. Scope 3 emissions mainly contributed by the purchase of raw materials. On these bases, overall approach of promoting climate action by LONGi is observe requirements from the SBTi, execute requirements of RE100, EP100, and EV100:

- **By higher percentage consumption of RE, it is to ensure separation of operations from GHG emissions**
- **Release potentials to continuously drive down energy emission intensity from unit products**
- **Actively adopt measures such as electric vehicles, low-carbon working and so on to reduce emissions by means of managements**
- **Cooperate with upstream and downstream enterprises for a green and low-carbon development on the value chain**

1. RE100

From RE progress on RE100 in 2020, LONGi purchased about 98% RE from the market (namely via PPA), taking up around 41% of total electricity consumptions in 2020. If this supply comes from the grid and not be tracked, about 1,330,000 tCO₂e emissions (about 52% of total LONGi Scope 1&2 emissions in 2020) would be produced.

It is evident that increased ratio of renewable electricity served as an essential measure for implementing the RE100 initiative, and a critical measure for deliver carbon peak and neutrality goals by LONGi. In the future, LONGi will attain its goal of 100% renewable energy power by the purchasing RE from the market, self-owned facilities generation, third party on-site generation, and purchasing of green certificates and so on.

06 Future Actions

2. EP100

As a solar manufacturer covering the industrial chain, LONGi boasts many production processes and procedures ranging from monocrystalline silicon, wafers, cells, to modules. In June 2020, LONGi's Wafer Business Unit launched its energy management system IT application project, which will offer strong, accurate data supports to the management of energy consumption. LONGi has carried out 99 energy-saving projects across the Group in 2020, including 82 technical upgrade projects and 17 managerial projects, saving an annual total of 101.21 million Yuan.

Using renewable power is a way for LONGi to reduce carbon emissions, but considering costs and pressure in purchasing renewable electricity, LONGi will put more efforts in its energy-saving and consumption-reduction work:

- **Complete of the rectification's facilities in Baoshan plant for tail gas recovery and utilizations of natural gas.**
- **Utilize excessive heats from the production processes.**
- **Upgrade facilities.**
- **Water saving.**

3. EV100

Start from promotions and utilizations from the electric vehicles first, and then extends to the green office within across LONGi group. Although it would not drive down emissions in a rapid manner, but it is an action for the international initiative, reflecting the practices of the company on promotion of EV100. These will have the good publicity effectiveness to the company as well.

- **Set the installation principles of electric vehicle charging facilities in Group level.**
- **Strive to achieve 100% electricity based power for the company vehicles (including commuting and commercial vehicles) by 2028, and develop a management policies that encourages the use of electric vehicles (such as priority admission, priority parking in the park etc.).**
- **Install "PV-storage-charging" integrated intelligent charging sheds for parking in certain locations to provide more renewable electricity to electric vehicles for truly "zero-carbon travels".**
- **Actively carry out internal green, low-carbon and energy-saving training among employees.**

4. Zero Carbon Plant

We plan to reduce and achieve Zero Carbon operational boundary GHG emissions of Baoshan Factory by the purchase of renewable electricity, energy-saving, and offset remaining emissions through using carbon credits within two years: Besides the phased executions for these initiatives in LONGi, the company announced its practices of “Zero Carbon” in Baoshan production base.

In incoming two years, we plan to deliver the zero emission goals by offsetting the emissions in the operation scope by RE purchasing, energy saving related rectification and carbon emission purchasing in Baoshan plant.

Step 1: Ensure 100% utilizations of renewable electricity (RE100) throughout the year.

Step 2: Finish the technical rectifications to reduce natural gas leakage (EP100).

Step 3: Promote green transportation and green office (EV100).

Step 4: Purchase CCER or other carbon credit to offset remaining emissions (carbon asset management).

The Zero Carbon pilot at Baoshan plant demonstrates the comprehensive pathway of "Actions + offset", which is in line with the practical philosophy of international/domestic carbon neutrality¹ practices, while costs able to be controlled.

5. Green Supply Chain

As most competitive manufacturing industry in China, this industry ought to accelerate its green supply chain development featured with high technology, low resource consumption and low environmental pollutions. LONGi is a leading company in the photovoltaic industry, it has responsibilities to promote the green transformation of the photovoltaic industry supply chain, to reduce the carbon footprint on bases of calculations on the value chain. Eventually, it is able to demonstrate the green and low-carbon image and efforts by Chinese photovoltaic enterprises, and enhance its competitiveness in the international market.

- Establish a green supply chain system and carry out green supplier evaluation.
- Carry out more accurate value chain emission accounting.
- Empower suppliers build develop partnership featured with common and green values.
- Provide energy-saving support externally.

¹ Currently, there are no internationally accepted or widely adopted carbon neutral standards. Referring to the available carbon neutrality standard PAS2060 issued by the British standards organization BSI, companies must formulate GHG management measures when planning and practicing carbon neutrality, and continuously reduce their own GHG emissions. Part of the GHG emissions that difficult to be completely avoid can be offset by purchasing carbon credit.

07 Conclusion

The COVID-19 pandemic had posed serious challenges to the world economic development and climate actions, but it introduced a historic opportunity for a new round of technological revolution and industrial transformation. All walks of life should seize the opportunity to promote economic “**green recovery**” at the closing period of this pandemic and pool strong forces for sustainable development.

LONGi Group, as a player in renewable energy industry, needs to supply the high efficiency equipment for power generations with renewable energy to customers persistently while it should to minimize its own carbon emissions to “**Net Zero**” level in a rapid manner. Through these efforts, LONGi is able to deliver its “**Zero carbon**” results.

LONGi will make its utmost efforts to honor its commitments of climate action, move global energy transition forward, work with partners to materialize the desired vision of harmonious co-existence between mankind and nature.