

cautiously forming strategic alliances with domestic and foreign industry players on technology. United Renewable Energy is actively laying out its patented technologies, with a total of 144 patents as of the end of 2022.

	2020	2021	2022
Number of Patents Granted (Cumulative)	139	117	144

New Business Group (Energy Storage System)

United Renewable Energy completed the Taipower South Yan-Tian (SYT) ESS system construction project, which is currently the largest energy storage system construction project in a single site in Taiwan, with a total construction volume of 15MW/15MWh of fixed power / fixed capacity.

Short-term goal: To build energy storage sites and new energy storage equipment for solar photo-voltaic power stations due to excess capacity.

Medium-term goal: To actively develop a combination of containerized energy storage products to support the top-of-the-line dReg0.25 frequency regulation service for the Taipower electricity trading platform.

Long-term goal: To participate in the construction of distribution and transmission level storage sites, providing products and services at different levels from 5 MW to over 100 MW.

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This URE 15 MW system near Tainan, Taiwan is designed to last 20 years

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7.3 Energy, Resource Management and Recycling

In addition to producing high-efficiency solar cells, modules, and power station systems that reduce greenhouse gas emissions for the planet, United Renewable Energy is also actively engaged in water and electricity conservation efforts. The company has set up an energy-saving project team to promote energy-saving management programs in offices, public areas and production lines. The energy-saving project team is subdivided into electrical machinery, air conditioning and exhaust, gas chemistry, water supply and drainage, etc. Each plant appoints an engineer to participate, with one of them serving as the convener of the team and the appointed supervisor in charge of counseling. United Renewable Energy has been implementing energy and water saving programs since 2011, and

has been awarded the water and energy saving excellence awards by National Science and Technology Council. The cumulative energy savings of 4,395 kwh in the past three years is equivalent to a reduction of 2,228 tons of CO2 emissions and NT\$10.11 million in electricity bill savings, demonstrating United Renewable Energy's commitment to sustainable energy saving.

United Renewable Energy has obtained ISO 14001 environmental management system certification for the Hsinchu Science and Industrial Park, Zhunan and Tainan plants.

ISO14001 certification



7.3.1 Energy Management GRI 302-1, 302-3, 305-4

As the leading solar power plant in Taiwan, United Renewable Energy not only generates profits, but also has a high ethical standard for energy management. Energy saving is definitely an important issue for United Renewable Energy.

United Renewable Energy uses energy from both renewable and non-renewable sources. Non-renewable energy is primarily purchased electricity, followed by a small amount of diesel fuel (used in power generators). total energy consumption in 2022 was approximately 452 megajoules. Since the installation of solar panels in 2014, self-generated electricity has reached 298,768 kWh by 2022.

The total energy consumption statistics are as follows

Unit: Megajoule

Energy Type	2020	2021	2022
Purchased electricity	475.58	456.09	452.36
Self-generated and self-used solar power	0.10	0.08	0.06
Total consumption	475.68	456.18	452.42
Intensity (MJ/MW)	0.40	0.36	0.32

Note 1: Joule conversion unit is 1 degree of electricity = 3.6 million joules.

Note 2: The correction is taken from the 2nd decimal place.

Note 3: Corrected data for 2020. Self-generated and self-used solar power changed from 0 to 0.1.

Note 4: Correction of 2021 data. Self-generated and self-used solar power was changed from 0 to 0.08, and purchased electricity was changed from 475.11 to 456.09.

Note 5: Intensity = Total consumption / Production capacity (MW)

Energy saving measures and performance over the years

By comparing energy efficiency in cross-plant meetings and identifying the best mode of operation, the energy saving team launched operations in all plants in parallel to improve energy efficiency in all plants. 2022 electricity was mainly used in plant systems and production equipment, with savings through load management and energy saving measures, resulting in energy savings of approximately 8.8 megajoules, equivalent to 1,247 tons of carbon emissions.

Note: The calculation of 0.509 kilograms of CO₂e generated per unit of electricity, source from Bureau of Energy, Ministry of Economic Affairs.

United Renewable Energy's efforts to invest in energy savings include:

- ✔ Load management: Adjust UPS load measurement configuration, OEX/AEX/GEX/CDA/PV/ice machine load reduction, cooling water tower cleaning to improve efficiency.
- ✔ Energy saving measures: cooling water tower cleaning, office/stairs/corridor air conditioning energy saving, office area lighting additional zipper switch & warehouse lighting improvement (pull lamp + reduction), adjusting dust-free room lighting according to production line, etc.

 The energy-saving results of each plant in the past three years are summarized as follows:

Unit: Megajoule

Year	2020	2021	2022	Subtotal
Electricity (Megajoule)	2.3	4.7	8.8	15.8
Greenhouse Gas (Tonnes CO ₂ e)	329	652	1,247	2,228

Note 1: Energy saving calculation: Estimated energy saving before and after improvement of each project

Note 2: Electricity emission factor measured at 0.502 kg CO₂e/kWh in 2020 and 0.509 kg CO₂e/kWh in 2021 and 2022; source from Bureau of Energy, Ministry of Economic Affairs.

7.3.2 Water Resources Management GRI 303-1, 303-3

United Renewable Energy uses water from various reservoirs in each area, including the Baoshan Reservoir for the Hsinchu and Hsinchu Science and Industrial Park plants, the Yung-Ho-Shan Reservoir for the Zhunan plant, and the Nan-Hua Reservoir for the Tainan plant. In terms of natural resource saving, the energy saving team not only invests in water recycling efforts, but also uses a small amount of water from rainwater recycling. Cherishing water resources is also an important part of the green industry, and United Renewable Energy's water saving efforts have resulted in the following:

Water Sources

Unit: million liters

Water Sources	2020	2021	2022
Storage water (rainwater, recycled water)	359.96	293.65	269.73
Tap water	710.57	682.60	693.93



Annual water recycled over the past years

United Renewable Energy has optimized the machine's water consumption by adapting its production capacity and designed the lowest water consumption model.

The following two main management guidelines have been established for water saving measures based on environmental considerations and evaluations:

- ✔ Process water reduction: Optimized process water evaluation and reuse of process recycled water
- ✔ Water recycling and reuse: Rainwater, cooling water and local scrubber drainage recycling and reuse

Among them, as the Hsinchu Science and Industrial Park plant ceased production of the cell process in 2022, the proportion of water recycled and improved in 2022 compared to 2021 was lower. The following table summarizes the water saving benefits of each major plant in the past three years:

Unit: million liters

		2020	2021	2022
Hsinchu Science and Industrial Park Plant	Total water consumption	130.02	66.85	43.48
	Recycle and reuse	111.30	10.17	0.07
	Water saving improvement percentage	85.6%	15.2%	0.1%
Zhunan Plant	Total water consumption	331.21	405.16	293.03
	Recycle and reuse	111.46	150.18	132.81
	Water saving improvement percentage	33.7%	37.1%	45.3%
Tainan Plant	Total water consumption	494.80	395.99	357.41
	Recycle and reuse	134.00	172.22	136.85
	Water saving improvement percentage	27.1%	43.5%	38.3%

Note 1: The formula for calculating recycle and reuse is: the amount of water recycled / the number of days in the month.

Note 2: The data source is based on the meter reading data of each plant equipment flow.

■ Water saving measures over the years

United Renewable Energy has implemented a number of wastewater recycling system improvements, including: the use of pure water and recycled water system resin regeneration fast and slow wash water recycling, pure water system sand filter tower and activated carbon tower forward and reverse wash water recycling, rooftop rainwater recycling system and Fan coil unit cooling water recycling; process water saving improvements focused on adjusting the machine Taiwater parameters, process machine water reduction, plant annual maintenance water saving control, plant watering, water saving by cutting water supply by half, pure water system RO drainage recycling to the filter tank, wet process wastewater recycling, cleaning of machine filter board after mud dewatering, additional process wet cleaning tower recycling system, improved water recycling of wet process. In 2022, we saved water and reduced water supply through measures such as recycling system of process machine drainage, shutting down watering at the plant and replacing it with manual unscheduled watering, and replacing the wet washing tower of the process machine with a dry machine, with an annual water saving performance of approximately 30.81 million liters. The accumulated water saving performance of each plant from 2013 to 2022 was approximately 568.37 million liters.

7.4 Pollution prevention and control

Under the ISO 14001 management system and PDCA continuous improvement concept, United Renewable Energy's pollution prevention begins at the source and actively invests in reducing the consumption of raw materials and natural resources in order to reduce the use of pollutants. We continue to manage air pollution emissions, reduce effluent discharges, and reduce waste disposal, with the aim of balancing production and environmental protection.