

High Material Issue 08

Energy Reduction and Utilization of Renewable Energy

In 2016 World Economic Forum, the climate change issue was discussed as an event with the most significant impacts on society. Likewise, climate change has become a global agenda that affects national policies and the system. Korea has been striving to implement sustainable eco-friendly policies and voluntarily reduce GHG emissions such as the introduction of emission trading scheme in 2015. Samsung SDI has been managing the risks of climate change and reducing its impacts with the slogan of 'Lead the market with technology based on changes and innovations as an eco-friendly company'.

Energy Management

Samsung SDI, as an eco-friendly energy company, established its company-wide energy management guideline and implemented low carbon/energy management. In addition, we further require overseas corporations to obtain energy management system (ISO 50001) certificate that is currently implemented in Korea at their work sites to continuously improve energy and environmental management. Moreover, Samsung SDI considered to introduce green energy such as biomass steam and solar power to facilitate the introduction of renewable energy.

Energy Saving Activity

Enhanced energy management at worksites

As three energy management activities, Samsung SDI implemented segmentation of per-unit production cost indicators management of energy balance, and improvement of verification for reduction impacts. Since 2015, we have continuously implemented the improvement of energy management such as energy consulting from external experts.

Integration and advancement of energy management system

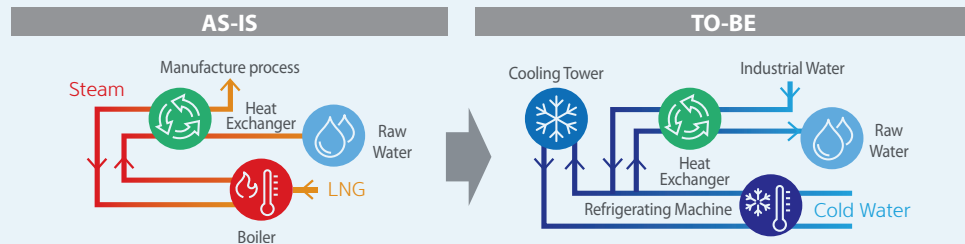
For efficient energy management, Samsung SDI integrated Energy Management System (S-GEMS) to further reinforce energy saving activities, which had been dually managed by battery and electronic material divisions in July 2016. In doing so, its management system of energy use became more effective; for instance, real time monitoring for energy use performance became possible.



BUSINESS CASE

Installation of heat exchanger for heating industrial water

Samsung SDI historically used LNG boilers to heat industrial water required for its processes during the winter. However, we installed heat exchangers in January 2016 and utilized waste heat from cooling water as thermal energy to heat industrial water. With heated industrial water, reverse osmosis (RO) can be produced, which lead to the reduction of energy costs that were used to heat RO water. As a result, KRW 690 million was saved annually and this activity was considered as an environmentally innovative case for the reduction of wasted energy.





Response to Emission Trading Scheme

Samsung SDI was selected as an allocation target company for the emission Trading Scheme in 2015. In response, we revised the company-wide GHG management rules to establish MRV (Monitoring, Reporting, and Verification) carbon management system. In 2016, we conducted internal audit trainings for GHG managers at each worksite to improve monitoring and verification. In addition, we conducted internal audit for monitoring plan reports and specification through cross-examinations at each worksite in order to enhance managers' capability who are responsible for relevant tasks and to improve the management levels of worksites. In 2017, Samsung SDI plans to set up and implement strategies to better manage GHG at overseas corporations such as Europe and China.

Response to Carbon Disclosure Project

CDP (Carbon Disclosure Project) is a non-profit organization, under the consignment of global financial investment institutes, which requests the management data about response to global environmental issues to major registered companies in each nation. In 2016, there was a transition of its evaluation system from a system based on companies' disclosure and achievement scores to a system where companies are assessed between A- and D- grading scale (disclosure (D, D-), recognition (C, C-), management (B, B-), and leadership (A, A-)). Samsung SDI was ranked A-, which is equivalent to top 25% among 1,839 companies that responded.

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Input

Financial Capital	Energy saving investment and activity	Unit	2014	2015	2016
	Total investment	KRW million	1,310	12,360	2,312
Fuel saving	Case	148	167	129	
Power saving	Case	1,021	869	513	

Natural Capital	Energy use	Unit	2014	2015	2016
	Total	TJ	13,683	11,609	12,876
Domestic	TJ	10,247	7,612	8,033	
Overseas	TJ	3,436	3,997	4,843	
Intensity	TJ/KRW 100 million	0.24	0.23	0.24	

Output

Natural Capital	GHG Emissions		Unit	2014	2015	2016
	Direct/indirect emissions	Total emissions	tCO ₂ e		731,089	646,292
Direct emissions		tCO ₂ e		84,830	92,964	99,847
Indirect emissions		tCO ₂ e		646,259	553,328	648,080
Intensity		tCO ₂ e /KRW 100 million		12.88	13.04	13.74
Other emissions	Business trip	tCO ₂ e		1,925	2,155	2,184
	Product transportation	tCO ₂ e		549	1,395	768
	Small-sized Li-ion battery	tCO ₂ e			383,760	427,735
Per product	Automotive & ESS battery	tCO ₂ e		457,183	145,618	178,479
	Electronic materials	tCO ₂ e		71,708	88,630	110,924
	R&D and others*	tCO ₂ e		202,198	28,284	30,788

* Including PDP business amounting to 163,639 in 2014

Natural Capital	Energy savings activity		Unit	2015	2016
	Saved amount	Fuel	tCO ₂ e		3,694
Electricity		tCO ₂ e		32,648	43,597
Reduced amount (Effect)	Fuel	TJ(KRW 100 million)		73(17)	194(28)
	Electricity	TJ(KRW 100 million)		677(131)	899(109)