

ECO SSOT V3.0.0 Instruction



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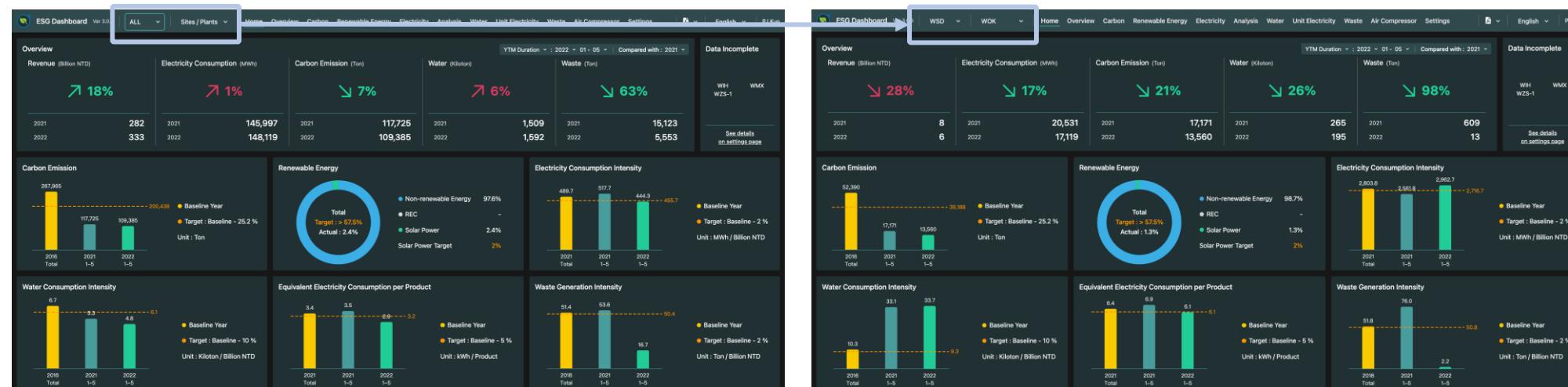


Navigation Bar



- 1 Wistron business group options: select “All, WT , WSD, New boundary ” from the navigation bar to adjust sources for all data.
- 2 Language options: Chinese and English are provided.
- 3 System functions: includes all energy data and analysis, such as homepage, overview, carbon, renewable energy, electricity, analysis, water, unit electricity, air compressor, waste, settings.
- 4 Instruction: click the button here to open instruction file (in English or Chinese).
- 5 By site / By Plant options: select “All ”, “By site ”, “By Plant ” from the navigation bar to adjust sources for all data.
- 6 User name: current logged-in account is shown at the right side of navigation bar.

Example combining 1 and 5 .





Homepage



- 1
 - YTM Duration / Month: select year and the end month (start from January) / single month for calculation.
 - Compared with: select year to compare with current year, and the result of all data comparison will be shown in dashboard 2 and 3.
- 2 Trend of YTM and comparison year data are shown in numbers.
- 3 Trend and percentage of YTM, baseline year, comparison year, and target are shown in bar charts.
- 4 Plants with incomplete data are listed here, and shortcut button for data status detail from the settings page is provided.



System functions: Overview, Carbon, Renewable Energy, Electricity, Water, and Unit electricity

The screenshot shows a top navigation bar with two tabs: '1 Current Year' and '2 History Years'. Below this is a search bar with dropdown menus for 'Month' (set to 2022 05) and 'Target' (-2% compared to last year). A legend at the bottom right indicates 'Miss Target' (red dot), 'Meet Target' (green dot), and 'Missing Data' (grey box).

1 Current year / history years: default selection is set as “current year”, “history years” function is detailed in 2 .

A YTM Duration / Month: select year and the end month (start from January) / single month for calculation.

B Target: data trend compared with comparison year.

C Data status: different status is shown in different light / background.

The screenshot shows a search bar with fields for 'Year' (2020 to 2022), 'Month' (Year To Month, 12), 'Dimension' (ALL), and a 'Search' button. A legend at the top right shows 'Miss Target' (red dot), 'Meet Target' (green dot), and 'Missing Data' (grey box). A 'G' label points to an 'Excel' export button.

2 History years function:

D Year: select range of years or single year.

E Month: select month for year to month / single month.

F Dimension: select data dimension, such as all, by site, by plant.

G Excel: export all selected data as excel file.



Overview: Electricity Consumption, Water Consumption, Revenue, and ASP

Current year

Electricity, Water, Revenue, and ASP																
Site	Electricity Consumption (kWh)				Water Consumption (Ton)				Revenue (Billion NTD)				ASP (Thousand NTD / Product)			
	2020	2021	Percentage	Gap *	2020	2021	Percentage	Gap *	2020	2021	Percentage	Gap *	2020	2021	Percentage	Gap *
WTZ	23,187,298	34,392,042	9%	48%	484,675	628,227	16%	30%	6.17	10.22	1%	66%	0.41	0.57	9%	40%
WOK	92,194,094	50,960,229	14%	-45%	996,876	619,542	15%	-38%	55.90	18.38	2%	-67%	1.12	1.06	18%	-5%
WKS	38,144,958	38,349,022	10%	1%	521,940	473,369	12%	-9%	84.14	89.28	11%	6%	8.68	7.74	129%	-11%
WZS	125,079,529	127,112,053	34%	2%	1,585,360	1,632,748	41%	3%	123.93	151.01	19%	22%	2.36	2.37	39%	1%
WMX	34,342,494	44,728,596	12%	30%	96,167	99,237	2%	3%	142.52	144.08	18%	1%	388.58	295.46	4,920%	-24%
WIH	18,090,312	17,877,724	5%	-1%	120,513	134,489	3%	12%	16.16	18.50	2%	15%	5.92	6.26	104%	6%
WCZ	5,186,219	6,279,234	2%	21%	4,135	4,973	0%	20%	34.35	39.38	5%	15%	5,716.86	6,849.13	114,048%	20%
WCQ	14,845,884	16,371,918	4%	10%	80,388	94,370	2%	17%	46.75	58.80	7%	26%	11.53	14.62	243%	27%
WCD	30,530,402	39,699,209	11%	30%	175,529	253,518	6%	44%	184.64	278.49	34%	51%	14.97	16.75	279%	12%
WHC	12,510,007	-	-	-	62,980	56,148	1%	-11%	-	-	-	-	-	-	-	-
WNH	6,898,443	-	-	-	20,134	20,443	1%	2%	-	-	-	-	-	-	-	-
Total	401,009,640	375,770,027	100%	-6%	4,148,697	4,017,064	100%	-3%	694.55	808.15	100%	16%	4.73	6.01	100%	27%

History years

Electricity, Water, Revenue, and ASP																
Site	Electricity Consumption (kWh)				Water Consumption (Ton)				Revenue (Billion NTD)				ASP (Thousand NTD / Product)			
	2020	2021	Percentage	Gap *	2020	2021	Percentage	Gap *	2020	2021	Percentage	Gap *	2020	2021	Percentage	Gap *
WTZ	23,187,298	34,392,042	-	48%	484,675	628,227	-	30%	6.17	10.22	-	66%	0.41	0.57	-	40%
WOK	92,194,094	50,960,229	-	-45%	996,876	619,542	-	-38%	55.90	18.38	-	-67%	1.12	1.06	-	-5%
WKS	38,144,958	38,349,022	-	1%	521,940	473,369	-	-9%	84.14	89.28	-	6%	8.68	7.74	-	-11%
WZS	125,079,529	127,112,053	-	2%	1,585,360	1,632,748	-	3%	123.93	151.01	-	22%	2.36	2.37	-	1%
WMX	34,342,494	44,728,596	-	30%	96,167	99,237	-	3%	142.52	144.08	-	1%	388.58	295.46	-	-24%
WIH	18,090,312	17,877,724	-	-1%	120,513	134,489	-	12%	16.16	18.50	-	15%	5.92	6.26	-	6%
WCZ	5,186,219	6,279,234	-	21%	4,135	4,973	-	20%	34.35	39.38	-	15%	5,716.86	6,849.13	-	20%
WCQ	14,845,884	16,371,918	-	10%	80,388	94,370	-	17%	46.75	58.80	-	26%	11.53	14.62	-	27%
WCD	30,530,402	39,699,209	-	30%	175,529	253,518	-	44%	184.64	278.49	-	51%	14.97	16.75	-	12%
WHC	12,510,007	11,043,912	-	-12%	62,980	56,148	-	-11%	0.00	0.00	-	-	0.00	0.00	-	-
WNH	6,898,443	6,420,678	-	-7%	20,134	20,443	-	2%	0.00	0.00	-	-	0.00	0.00	-	-
Total	401,009,640	375,770,027	-	-6%	4,148,697	4,017,064	-	-3%	694.55	808.15	-	16%	4.73	6.01	-	27%



Carbon Emission: Electricity Consumption, Carbon Emission Factor, Carbon Emission, and REC Target

Current year

Carbon Emission										
YTM Duration : 2021 ~ 01 ~ 12 ~ Target : -21% compared to 2016										
Current Year History Years										
● Miss Target ● Meet Target Missing Data										
Electricity Consumption (kWh)			Carbon Emission Factor (e)			Carbon Emission (Ton)			REC Target for Carbon Offset (h-i)*79%*1000/e	
Site	Total (a)	Solar Power (b)	REC (c)	Non-renewable (d=a-b-c)	(Ton CO ₂ e/MWh)	Scope1 (f)	Scope2 (g=d*e/1000)	2021 Total (h=f+g)	2016 Total (i)	Gap (h/i-1)
WTZ	34,392,042	0	18,163,901	16,228,141	0.7921	2,236	12,854	15,091	22,060	-32%
WOK	50,960,229	582,070	26,786,129	23,592,030	0.7921	3,162	18,687	21,024	58,770	-64%
WKS	38,349,022	1,329,567	19,009,837	18,009,618	0.7921	-	14,265	14,265	21,650	-34%
WZS	127,112,053	4,978,650	61,511,384	60,622,019	0.8042	6,364	48,752	55,116	128,411	-57%
WMX	44,728,596	0	23,431,976	21,296,620	0.5050	-	10,755	10,755	8,047	34%
WIH	17,877,724	0	9,550,922	8,326,802	0.5090	388	4,238	4,626	3,121	48%
WCZ	6,279,234	0	3,372,709	2,906,525	0.4280	1	1,244	1,245	1,451	-14%
WCQ	16,371,918	0	7,729,877	8,642,041	0.8587	-	7,421	7,421	31,026	-76%
WCD	39,699,209	0	20,795,157	18,904,052	0.8587	-	16,233	16,233	22,213	-27%
WHC	-	-	6,564,824	-	0.5090	200	-3,341	-3,142	6,054	-152%
WNH	-	-	3,600,284	-	0.5090	4	-1,833	-1,828	3,238	-156%
Total	375,770,027	6,890,287	200,517,000	168,362,740	-	11,530	129,276	140,806	306,041	-54%

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REC will only be purchased at the end of the year. Therefore, REC data will be shown only when December is selected.

History years

Carbon Emission									
Target : -21% compared to 2016									
Current Year History Years									
● Miss Target ● Meet Target Missing Data									
Site	Jan, 2021	Feb, 2021	Mar, 2021	Apr, 2021	May, 2021	Jun, 2021	Jul, 2021	Aug, 2021	Sep,
	Carbon Emission (Ton)	Carbon Emission							
WTZ	2,325	2,068	2,435	2,138	2,384	2,725	2,981	2,963	...
WOK	4,308	3,328	3,037	3,483	3,068	4,693	4,356	4,477	...
WKS	3,024	2,347	2,769	2,272	2,481	2,823	3,177	3,222	...
WZS	6,654	5,735	7,890	8,626	8,989	10,093	10,149	10,591	1
WMX	1,615	1,567	1,960	1,803	2,128	2,219	2,042	2,305	...
WIH	817	602	907	864	905	999	879	796	...
WCZ	210	177	206	217	237	234	249	231	...
WCQ	1,188	678	727	684	1,072	973	1,313	1,280	...
WCD	1,990	1,956	2,600	2,671	2,912	2,928	3,416	3,638	...
WHC	18	16	18	17	13	7	12	19	...
WNH	0	0	0	0	4	0	0	0	...
Total	22,151	18,474	22,548	22,775	24,193	27,694	28,573	29,522	2



Renewable Energy: Electricity Consumption, Percentage, and REC Target

Current year

Renewable Energy					
Site	Electricity Consumption (kWh)		Percentage (b+c) / a)	REC Target for Renewable Energy (kWh) (a*50% - b)	Usable Roof Area (M ²)
	Total (a)	Solar Power (b)	REC (c)		
WTZ	34,392,042	0	18,163,901	53%	17,196,021
WOK	50,960,229	582,070	26,786,129	54%	24,898,044
WKS	38,349,022	1,329,567	19,009,837	53%	17,844,944
WZS	127,112,053	4,978,650	61,511,384	52%	58,577,377
WMX	44,728,596	0	23,431,976	52%	22,364,298
WIH	17,877,724	0	9,550,922	53%	8,938,862
WCZ	6,279,234	0	3,372,709	54%	3,139,617
WCQ	16,371,918	0	7,729,877	47%	8,185,959
WCD	39,699,209	0	20,795,157	52%	19,849,604
WHC	-	-	6,564,824	-	0
WNH	-	-	3,600,284	-	0
Total	375,770,027	6,890,287	200,517,000	55%	180,994,727

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- 1 REC will only be purchased at the end of the year. Therefore, REC data will be shown only when December is selected.

History years

Renewable Energy												
Site	Target : Percentage > 50 %											
	Jan, 2021 Percentage *	Feb, 2021 Percentage *	Mar, 2021 Percentage *	Apr, 2021 Percentage *	May, 2021 Percentage *	Jun, 2021 Percentage *	Jul, 2021 Percentage *	Aug, 2021 Percentage *	Sep, 2021 Percentage *	Oct, 2021 Percentage *	Nov, 2021 Percentage *	Dec, 2021 Percentage *
WTZ	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	678%
WOK	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	859%
WKS	2%	3%	2%	4%	3%	3%	3%	3%	3%	5%	7%	711%
WZS	4%	6%	4%	4%	4%	3%	4%	3%	4%	3%	5%	596%
WMX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	614%
WIH	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	795%
WCZ	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	864%
WCQ	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	350%
WCD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	613%
WHC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WNH	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	2%	2%	2%	2%	2%	1%	2%	1%	2%	2%	2%	673%



Electricity: Electricity Consumption, Revenue, Electricity Consumption per Billion NTD, and ASP

Current year

Electricity Consumption per Billion NTD												
Site	Electricity Consumption (kWh)			Revenue (billion NTD)			Electricity Consumption per Billion NTD			ASP (Thousand NTD/unit)		
	2020 (a)	2021 (b)	Gap (b/a-1)	2020 (c)	2021 (d)	Gap (d/c-1)	2020 (e=a/c)	2021 (f=b/d)	Gap (f/e-1)	2020 (g)	2021 (h)	Gap (h/g-1)
WTZ	23,187,298	34,392,042	48%	6.17	10.22	66%	3,758,393	3,363,853	-10%	0.41	0.57	40%
WOK	92,194,094	50,960,229	-45%	55.90	18.38	-67%	1,649,359	2,772,145	68%	1.12	1.06	-5%
WKS	38,144,958	38,349,022	1%	84.14	89.28	6%	453,354	429,545	-5%	8.68	7.74	-11%
WZS	125,079,529	127,112,053	2%	123.93	151.01	22%	1,009,254	841,736	-17%	2.36	2.37	1%
WMX	34,342,494	44,728,596	30%	142.52	144.08	1%	240,967	310,442	29%	388.58	295.46	-24%
WIH	18,090,312	17,877,724	-1%	16.16	18.50	15%	1,119,730	966,183	-14%	5.92	6.26	6%
WCZ	5,186,219	6,279,234	21%	34.35	39.38	15%	150,995	159,442	6%	5,716.86	6,849.13	20%
WCQ	14,845,884	16,371,918	10%	46.75	58.80	26%	317,579	278,447	-12%	11.53	14.62	27%
WCD	30,530,402	39,699,209	30%	184.64	278.49	51%	165,349	142,550	-14%	14.97	16.75	12%
WHC	12,510,007	-	-	-	-	-	-	-	-	-	-	-
WNH	6,898,443	-	-	-	-	-	-	-	-	-	-	-
Total	401,009,640	375,770,027	-6%	694.55	808.15	16%	577,366	464,974	-19%	4.73	6.01	27%

History years

Electricity Consumption per Billion NTD											
Site	Jan, 2021		Feb, 2021		Mar, 2021		Apr, 2021		May, 2021		Target : -2% compared to 2020
	Electricity Consumption/Billion NTD (kWh)										
WTZ	3,615,726		3,190,478		3,513,673		3,568,827		4,040,200		
WOK	1,832,878		2,520,578		3,618,212		2,493,214		3,132,000		
WKS	415,714		410,553		317,058		398,090		412,000		
WZS	767,074		899,260		773,861		861,472		881,000		
WMX	288,736		304,801		305,566		274,302		301,000		
WIH	868,504		1,041,872		962,424		1,092,627		1,121,000		
WCZ	182,605		124,046		151,169		123,041		141,000		
WCQ	535,560		362,073		259,793		273,715		404,000		
WCD	134,863		159,937		178,502		143,307		151,000		
WHC	0		0		0		0		0		
WNH	0		0		0		0		0		
Total	522,311		529,283		496,738		480,589		515,000		



Electricity: Single site

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ESG Dashboard Ver 3.0.6 | ALL | WZS-6 | Home | Overview | Carbon | Renewable Energy | Electricity | More | English | PJ Kuo

WT Electricity Consumption per Billion NTD

YTM Duration : Jan. - Oct. 2021 | Target : -2% Compared to last year

Current Year | History Years

• Miss Target • Meet Target | Missing Data

Site	Electricity Consumption (kWh)			Revenue (billion NTD)			Electricity Consumption per Billion NTD			ASP (Thousand NTD/unit)		
	2020 (a)	2021 (b)	Gap (b/a-1)	2020 (c)	2021 (d)	Gap (d/c-1)	2020 (e=a/c)	2021 (f=b/d)	Gap (f/e-1)	2020 (g)	2021 (h)	Gap (h/g-1)
WZS-6	13,209,805	15,507,280	17%	28.7	39.3	37%	460,425	395,041	-14%	8.4	7.6	-10%

2

Total Electricity Consumption

* Warning for Total Electricity Consumption : Monthly Electricity Baseline

(MWh)

(Month)

Electricity Consumption Target Chart

Show last year Off On

Electricity Consumption per Product (kWh/unit)

ASP (Thousand NTD)

Monthly cumulative electricity consumption

(2022.04.01 - 2022.04.24)

(MWh)

(Date)

Compliance status of each month

Year : 2022

• No Data • Meet Target • Miss Target

Electricity Consumption	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Per Product	•	•	•									
Intensity	•	•	•									
Total	•	•	•									

1 When there is only a single site selected, the visualized analysis chart of electricity consumption target will be shown in 2.

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Electricity: Electricity Consumption Target



1 Total Electricity Consumption Chart of last year & current year

- Blue bars: Last year electricity consumption.
- Green bars: Current year electricity consumption.
- Yellow line: Electricity baseline analyzed with AI by ECO system, based on production history of each site and the production of current month.
Total monthly electricity consumption lower than the yellow line stands for the effectivity of the power saving strategy for the month.

2 Monthly Cumulative Electricity Consumption

- Light green bars: Single day electricity consumption.
- Dark green bars: Cumulative total electricity consumption.
- Yellow line: Current month cumulative electricity consumption warning (last year electricity * current year target * cumulative production).

3 Current Month Electricity Consumption per Product & ASP Chart: Click A to show/hide last year data

- Red line: Electricity consumption intensity baseline for current year (missing target data shows above the line; meeting target data shows below the line).
- Orange line: Electricity consumption per product baseline for current year (missing target data shows above the line; meeting target data shows below the line).



Water: Water Consumption, Manpower, Water Consumption per person, Revenue, Water Consumption per Billion NTD, and Baseline Year

Current year

Water Consumption per Billion NTD												YTM Duration : 2022 ~ 01 ~ 05 ~ Target : -10% compared to 2016						
Site	Water Consumption (Ton)				Manpower (person)		Water Consumption per person (Ton)			Revenue (billion NTD)			Water Consumption per Billion NTD		Compared to Baseline Year			
	2021	2022	Percentage	Gap *	2021	2022	2021	2022	Gap *	2021	2022	Percentage	Gap *	2021	2022	Gap *	2016	Gap *
WTZ	249,382	194,193	12%	-22%	15,618	12,661	15,968	15,338	-4%	3,562	3,885	1%	9%	70,016	49,985	-29%	69,979	-29%
WOK	264,922	203,516	13%	-23%	14,416	10,788	18,377	18,865	3%	8,014	5,778	2%	-28%	33,056	35,223	7%	10,285	24%
WKS	178,685	119,415	8%	-33%	29,882	11,982	5,980	9,966	67%	39,255	9,545	3%	-76%	4,552	12,511	175%	4,100	205%
WZS	588,389	795,268	50%	35%	76,798	86,814	7,662	9,161	20%	53,942	75,813	23%	41%	10,908	10,490	-4%	10,859	-3%
WMX	35,718	45,670	3%	28%	20,960	28,508	1,704	1,602	-6%	52,103	69,583	21%	34%	686	656	-4%	2,333	-72%
WIH	50,146	49,294	3%	-2%	11,108	13,767	4,514	3,581	-21%	7,464	6,177	2%	-17%	6,718	7,981	19%	19,576	-5%
WCZ	1,915	2,073	0%	8%	2,084	2,308	0.919	0.898	-2%	17,809	16,898	5%	-5%	108	123	14%	438	-7%
WCQ	25,768	59,529	4%	131%	12,504	37,703	2,061	1,579	-23%	12,354	41,800	13%	238%	2,086	1,424	-32%	3,914	-64%
WCD	85,362	88,795	6%	4%	37,815	38,402	2,257	2,312	2%	87,502	103,333	31%	18%	976	859	-12%	1,631	-47%
WHC	21,728	23,385	1%	8%	-	-	-	-	-	-	-	-	-	-	-	-	-	
WNH	7,458	9,341	1%	25%	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	1,509,472	1,590,565	100%	5%	221,185	242,934	6,824	6,547	-4%	282,006	332,811	100%	18%	5,353	4,779	-11%	6,732	-29%

History years

Water Consumption per Billion NTD							Target : -9% compared to 2016					
Site	Jan, 2021		Feb, 2021		Mar, 2021		Apr, 2021		May, 2021		J1	
	Water Consumption per Billion NTD											
WTZ	70,753		64,148		65,084		71,136		79,650			
WOK	18,648		38,639		39,795		28,685		47,515			
WKS	3,150		5,908		4,068		4,448		5,803			
WZS	12,159		13,682		8,301		11,244		10,391			
WMX	555		548		619		632		1,021			
WIH	3,870		10,381		5,504		7,237		8,105			
WCZ	130		107		125		93		74			
WCQ	2,470		1,904		1,691		1,818		2,716			
WCD	890		989		1,118		834		1,070			
WHC	0		0		0		0		0			
WNH	0		0		0		0		0			
Total	5,345		6,305		4,667		4,858		5,557			



Manpower

- **Water Consumption per person :** Total water consumption divided by the adjusted manpower of the plant.
- **Manpower :** The manpower which shows on the interface is the adjusted manpower. The calculation method is to calculate the average daily incumbents of each factory in each month from the data of [Global Wistron Incumbent Manpower \(Note 1\)](#). However, since some sites have different plants, there are some manpower(such as site manpower, trustee manpower, non-fixed area workers, etc.) needs to be allocated according to the manpower ratio of each site.

For ease of explanation the current logic, the following is an example of WKS:

The table below is the manpower information of WKS in June 2022, and the red part is the part that needs to be allocated to WK-5 and WKS-6. That is, the sum of the above-mentioned site manpower, trustee manpower, non-fixed area workers.

Site	Plant	Manpower	Allocated manpower
WKS	WKS-5	1348.79	1958.27
WKS	WKS-6	1059.23	1537.86
WKS	WKS	1088.10	-



The current allocation logic is to allocate the 1088.10 people in the red part according to the manpower ratio of WKS-5 and WKS-6.

The calculation is as follows:

The manpower ratio of WKS-5 is : $1348.79 / (1348.79 + 1059.23) = 56\%$

The manpower ratio of WKS-6 is : $1059.23 / (1348.79 + 1059.23) = 44\%$

So, the allocated manpower of WKS-5 is : $1348.79 + 1088.10 \times 56\% = 1958.27$

the allocated manpower of WKS-6 is : $1059.23 + 1088.10 \times 44\% = 1537.86$

In the future, the water consumption, electricity consumption, and water consumption per person of each plant will base on the number of manpower which has been allocated.





Unit Electricity: Electricity Consumption, Production, Equivalent Electricity Consumption per Product

Current year

Equivalent Electricity Consumption per Product									
Site	Electricity Consumption (kWh)			Production (unit)			Equivalent Electricity Consumption per Product (kWh)		
	2020 (a)	2021 (b)	Gap (b/a-1)	2020 (c)	2021 (d)	Gap (d/c-1)	2020 (e=a/c)	2021 (f=b/d)	Gap (f/e-1)
WTZ	23,187,298	34,392,042	48%	7,483,813	14,337,640	92%	3.1	2.4	-23%
WOK	92,194,094	50,960,229	-45%	22,287,649	8,012,900	-64%	4.1	6.4	54%
WKS	38,144,958	38,349,022	1%	11,245,026	14,204,188	26%	3.4	2.7	-20%
WZS	125,079,529	127,112,053	2%	42,721,849	46,716,239	9%	2.9	2.7	-7%
WMX	34,342,494	44,728,596	30%	341,328	622,038	82%	100.6	71.9	-29%
WCZ	5,186,219	6,279,234	21%	377,763	335,464	-11%	13.7	18.7	36%
WIH	18,090,312	17,877,724	-1%	2,737,184	1,964,703	-28%	6.6	9.1	38%
WCQ	14,845,884	16,371,918	10%	5,301,189	6,217,116	17%	2.8	2.6	-6%
WCD	30,530,402	39,699,209	30%	15,066,004	24,680,676	64%	2.0	1.6	-21%
WHC	12,510,007	-	-	-	-	-	-	-	-
WNH	6,898,443	-	-	-	-	-	-	-	-
Total	401,009,640	375,770,027	-6%	107,561,804	117,090,964	9%	3.7	3.2	-14%

History years

Equivalent Electricity Consumption per Product								
Site	Electricity Consumption / Product (kWh)					Equivalent Electricity Consumption per Product (kWh)		
	Jan, 2021	Feb, 2021	Mar, 2021	Apr, 2021	May, 2021	Jun, 2021	Jul, 2021	Aug, 2021
WTZ	3	2	3	3	3	2		
WOK	6	6	10	6	6	8		
WKS	3	3	2	3	3	3		
WZS	2	3	3	3	3	3		
WMX	76	73	46	60	79			
WIH	9	8	8	10	10			
WCZ	16	13	13	13	21			
WCQ	5	3	2	2	4			
WCD	1	2	2	1	2			
WHC	0	0	0	0	0			
WNH	0	0	0	0	0			
Total	3	4	3	3	4			



Waste: Non-recyclable Waste Weight, Recyclable Waste Weight, Total, Revenue, Waste Generation Intensity, and Waste Recycling Rate

Current year

Waste Generation Intensity										
Site	Non-recyclable Waste Weight (Ton)		Recyclable Waste Weight (Ton)		Total (Ton)	2021.01 - 12 Revenue (Billion NTD)	Waste Generation Intensity (ton/billion NTD)			Waste Recycling Rate
	General *¹	Hazardous	General *²	Recyclable(Compost & Recycling)			2021.01 - 12	2018	Gap ((2021-2018) / 2018)	
	General *¹	Hazardous	General *²	Recyclable(Compost & Recycling)			2021.01 - 12	2018	Gap ((2021-2018) / 2018)	
WTZ	245.64	-	17.42	2,438.22	2,701.28	10.22	265.56	225.05	● 18.00%	90.44%
WOK	223.89	-	36.80	1,127.57	1,388.25	18.38	77.33	51.84	● 49.16%	81.91%
WKS	273.43	-	238.35	2,078.25	2,590.02	89.28	30.80	33.31	-7.55%	84.25%
WZS	828.91	-	118.14	12,930.08	13,877.13	151.01	94.28	84.25	11.91%	91.64%
WMX	461.13	-	384.07	4,428.69	5,273.89	144.08	36.77	25.62	● 43.50%	90.85%
WIH	70.42	-	27.33	336.26	434.02	18.50	27.48	14.74	● 86.50%	71.50%
WCZ	242.50	-	-	1,212.14	1,454.64	39.38	36.95	25.35	● 45.74%	83.30%
WCQ	36.40	-	58.90	3,198.26	3,293.55	58.80	58.20	64.58	-9.88%	95.19%
WCD	50.01	-	357.60	6,638.49	7,046.10	278.49	26.16	52.75	-50.41%	96.04%
WHC	21.43	-	7.90	83.83	113.16	-	-	-	-	80.16%
WNH	7.00	-	0.24	2.23	9.47	-	-	-	-	21.89%
Total	2,460.76	-	1,246.74	34,474.02	38,181.52	808.15	48.53	51.43	-5.64%	91.08%

History years

Waste Generation Intensity					
Site	Jan, 2021		Feb, 2021		Mar, 2021
	Waste Generation Intensity (ton/billion NTD)				
WTZ	305	250	272	242	272
WOK	64	130	88	64	88
WKS	32	32	36	32	36
WZS	112	123	87	108	87
WMX	28	67	46	39	46
WIH	31	40	31	29	31
WCZ	50	37	47	34	47
WCQ	52	57	63	63	63
WCD	24	24	38	33	38
WHC	0	0	0	0	0
WNH	0	0	0	0	0
Total	51	60	55	52	55



Missing Target Data Analysis

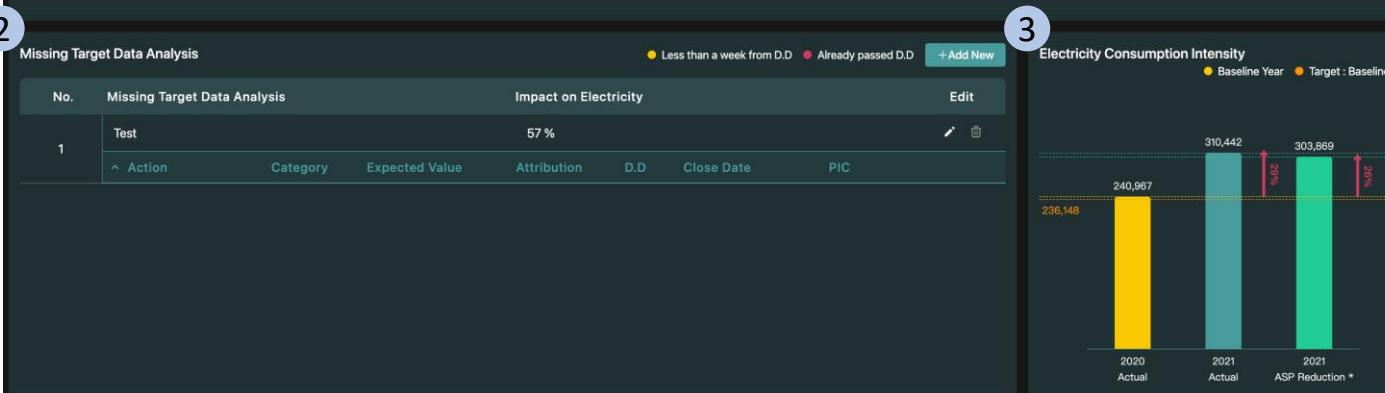
Site	Electricity Consumption (kWh)			Revenue (billion NTD)			Electricity Consumption per Billion NTD			ASP (Thousand NTD/unit)		
	2020 (a)	2021 (b)	Gap (b/a-1)	2020 (c)	2021 (d)	Gap (d/c-1)	2020 (e=a/c)	2021 (f=b/d)	Gap (f/e-1)	2020 (g)	2021 (h)	Gap (h/g-1)
WTZ	23,187,298	34,392,042	48%	6.17	10.22	66%	3,758,393	3,363,853	1 -10%	0.41	0.57	40%
WOK	92,194,094	50,960,229	-45%	55.90	18.38	-67%	1,649,359	2,772,145	1 ● 68%	1.12	1.06	-5%
WKS	38,144,958	38,349,022	1%	84.14	89.28	6%	453,354	429,545	1 -5%	8.68	7.74	-11%
WZS	125,079,529	127,112,053	2%	123.93	151.01	22%	1,009,254	841,736	1 -17%	2.36	2.37	1%
WMX	34,342,494	44,728,596	30%	142.52	144.08	1%	240,967	310,442	1 ● 29%	388.58	295.46	-24%
WIH	18,090,312	17,877,724	-1%	16.16	18.50	15%	1,119,730	966,183	1 -14%	5.92	6.26	6%
WCZ	5,186,219	6,279,234	21%	34.35	39.38	15%	150,995	159,442	1 ● 6%	5,716.86	6,849.13	20%

Electricity Consumption per Billion NTD : Analysis (Plant: WMX)

< Back



- 1 Click to enter Missing Target Data Analysis.
- 2 Maintain missing target reason and actions.
- 3 Electricity Consumption Intensity compared with ASP Reduction.

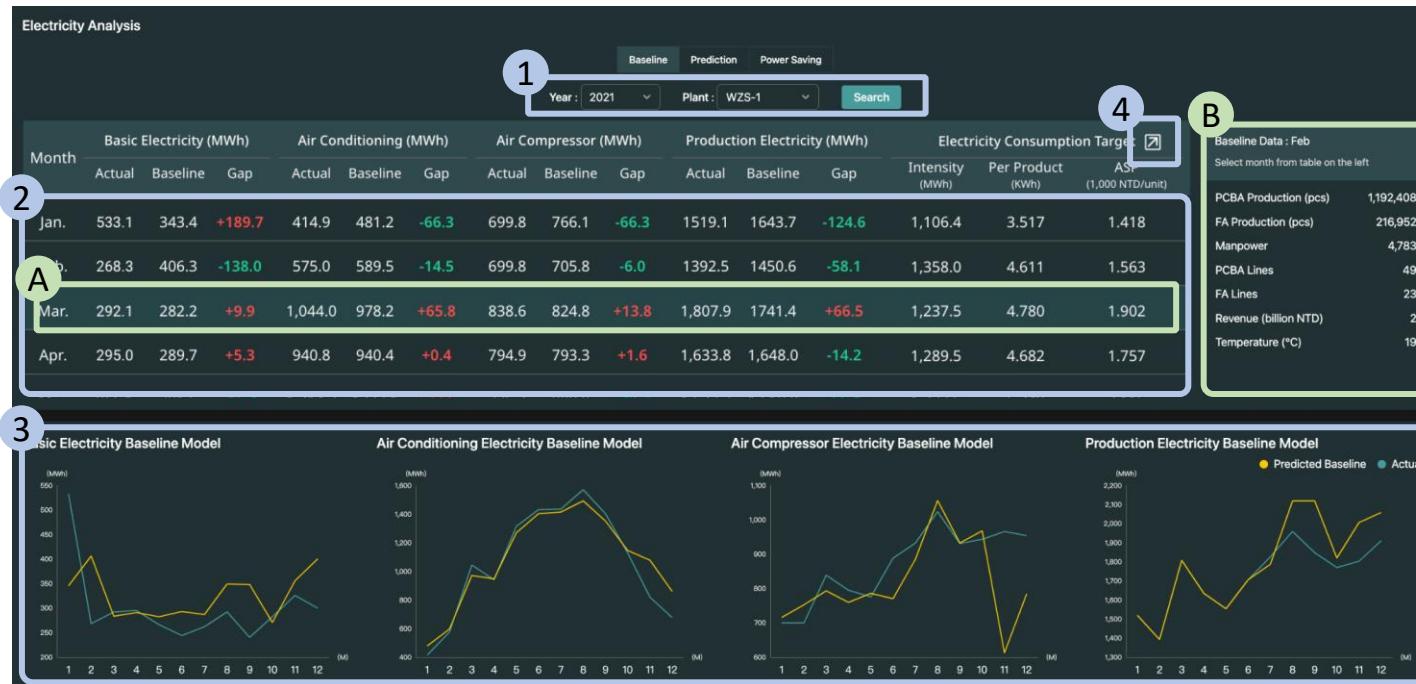




Analysis

- Analysis function is the integration of data science and prediction in ECO system.
- Functions: Baseline, Prediction, and Power Saving of electricity.

Baseline



- 1 Search for Year and Plant.
- 2 Predicted baseline, actual data, and gap of all types of electricity consumption:
Select data of a month from the table: ex. Select A, and all baseline data of the month will be shown in B.
- 3 Monthly trend chart of Electricity Baseline Model:
 - Includes predicted baseline (yellow line) and actual data (green line).
 - Four types: Basic Electricity , Air Conditioning Electricity , Air Compressor Electricity , and Production Electricity.

- 4 Click B to show visualized analysis of Electricity Consumption Target popup window:





Prediction

- Electricity prediction: includes shown by plant and search for year and month ; shown by month and search for plant.

Dimension: select “by plant”, and search for year and month.

Dimension : By Plant Year : 2021 Prediction Month : 11 **Search**

* Prediction was designed for REC purchase calculation.
Therefore, Annual REC Target is only shown for Nov.

Electricity Analysis

Baseline Prediction Power Saving

Dimension : By Plant Year : 2021 Prediction Month : 11 **Search**

* Predicted Electricity Consumption YTM = Actual + Predicted Electricity Consumption of 2 months

Plant	Monthly Electricity Consumption (kWh)			Annual REC Target (Nov)
	Predicted	Actual	Gap	
WTZ	2,336,201	2,676,036	+339,835	35,392,519
WZS-1	4,131,868	3,912,069	-219,799	50,310,557
WZS-3	1,502,797	1,595,136	+92,339	19,473,264
WZS-6	3,033,782	2,610,947	-422,835	37,400,203

Predicted Baseline Data : WZS-1		
Select month from table on the left	Nov	Dec
PCBA Production (pcs)	1,545,213	1,545,213
FA Production (pcs)	504,109	504,109
Manpower	5,472	4,000
PCBA Lines	52	52
FA Lines	26	26
Revenue (billion NTD)	4	4
Temperature (°C)	22	23

Predicted Annual REC Target Total : All plants
Only calculated in November

163,042,023 kWh



Prediction

Dimension: select “by month”, and search for year and plant.

Dimension : By Month ▾ Year : 2021 ▾ Plant : WZS-1 ▾ **Search**

Electricity Analysis

Baseline Prediction Power Saving

Dimension : By Month ▾ Year : 2021 ▾ Plant : WZS-1 ▾ **Search**

Month	Monthly Electricity Consumption (kWh)			Annual REC Target (Nov)
	Predicted	Actual	Gap	
Nov	-	3,912,069	+3,912,069	77,777
Dec	-	3,830,590	+3,830,590	-

Predicted Baseline Data : Dec

Select month from table on the left	Predicted	Actual
PCBA Production (pcs)	1,801,229	1,801,229
FA Production (pcs)	554,164	554,164
Manpower	4,150	5,874
PCBA Lines	52	52
FA Lines	26	26
Revenue (billion NTD)	4	4
Temperature (°C)	19	16

Electricity Baseline Model

● Predicted ● Actual



Power Saving

Electricity Analysis & Prediction

1

Baseline Prediction Power Saving

Year : 2021 Plant : WZS-1 Search

2

+ Add New

Type	Action	Expected Value												PIC	Calculation	Remark	Edit
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.				

Power Saving Amount

Type	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total

- 1 Search for year and plant: user can edit, add PIC, and remark. System will send email to new-added email account automatically.
- 2 Add new: once added, users ,except for admin member (Dawin, Alston, and Eric Yang), cannot edit or delete it,



Settings

- Settings page is the integration of new-added user demands and data status monitoring in ECO system..
- Functions: Annual Target Maintain, Carbon Emission Factor, and Renewable Energy Certificate (REC) Purchase.

Annual Target Maintain

- Three functions: Annual Target, Carbon Emission Factor, and Renewable Energy Certificate (REC) Purchase.

The screenshot displays the 'Annual Target Maintain' section of the ECO system settings. It features three main tables:

- Annual Target:** A table showing various performance metrics for the year 2022. The columns include Item, Baseline Year, Target Definition (Compared to Baseline Year), 2022 Target, Unit, and Edit (with a pencil icon). The data includes:
 - Electricity Consumption Intensity: Baseline 2021, Target -2%, Value 509.5, Unit MWh / billion NTD, Edit icon.
 - Water Consumption Intensity: Baseline 2016, Target -9%, Value 6.1, Unit Kiloton / billion NTD, Edit icon.
 - Carbon Emission: Baseline 2016, Target -21%, Value 211,692, Unit Ton, Edit icon.
 - Equivalent Electricity Consumption per Product: Baseline 2021, Target -5%, Value 2.7, Unit kWh / product, Edit icon.
 - Waste Generation Intensity: Baseline 2018, Target -2%, Value 50.4, Unit Ton / billion NTD, Edit icon.
 - Renewable Energy: Baseline 2022, Target Percentage > 60 %, Value 0.6, Unit %, Edit icon.
- Carbon Emission Factor:** A table showing carbon emission factors by site. The columns include Site, Carbon Emission Factor, and Edit (with a pencil icon). The data includes:
 - WMX: Factor 0.5050, Edit icon.
 - WCZ: Factor 0.4280, Edit icon.
 - WOK: Factor 0.7921, Edit icon.
 - WKS: Factor 0.7921, Edit icon.
 - WTZ: Factor 0.7921, Edit icon.
 - WIH: Factor 0.5090, Edit icon.
 - WTS: Factor 0.5010, Edit icon.
- Renewable Energy Certificate (REC) Purchase:** A table showing REC purchase details. The columns include Date, Total (MWh), Area, Amount (MWh), Price, Currency, Plant, and 綠證 (Green Certificate). The currency column has an edit icon, and the plant column also has an edit icon.

1 Search for year: select year.

2 Edit: table content can be edited.



Data Update Status

- Different lights suggest different status of data from multiple sources (including DPM, OPM, FEM).
- Status lights are followed by sources of each energy data.
- Data of last month is updated automatically in ECO system on the 10th of each month.

The screenshot shows a dashboard titled "May. Data Status (Next update: 7/10)". At the top, there are search filters for "Year: 2022" and "Month: 5", and a "Search" button. A callout labeled 1 points to these filters. A callout labeled 2 points to the "Smart Meter" column, which lists data sources for each plant. A callout labeled 3 points to a legend at the top right, which includes a note about CSR updates on the last day of each month.

Plant	DPM Auto	OPM Auto			FEM Auto	Waste Manual		
	Equivalent Production	Revenue	Manpower	Shipment	Smart Meter	Smart Water Meter	Solar Power	Waste Disposal
WCD(WT)	● DPM	● -	● -	● -	● CSR	● CSR	● -	● CSR
WCQ-1(WT)	● DPM	● -	● -	● -	● FEM	● FEM	● -	● CSR
WCZ(WT)	● -	● -	● -	● -	● -	● -	● -	● CSR
WHC(Corp)	● -	● -	● -	● -	● FEM	● FEM	● -	● CSR
WIH(WT)	● DPM	● -	● -	● -	● FEM	● FEM	● -	● -
WKS-1(WT)	● -	● -	● -	● -	● -	● -	● FEM	● -
WKS-5(WSD)	● DPM	● -	● -	● -	● FEM	● FEM	● FEM	● -
WKS-6(WSD)	● DPM	● -	● -	● -	● FEM	● FEM	● FEM	● -
WMX(WT)	● -	● -	● -	● -	● CSR	● CSR	● -	● -

- 1 Search for year and month: click search button after select year and month, all data of the selection will be shown on the page.
- 2 Data sources description: sources of each energy data is described in English, while status lights presenting FEM/DPM/OPM status are separated.
- 3 Update status light: different light color represents different update status
 - White light: No data (no system).
 - Green light: Data is up-to-date.
 - Red light: Data is not updated.
 - Yellow light: Data incorrect.



CSR Comparision

- Different lights suggest different CSR data status.
- Compare FEM data with CSR data. Formula: $(\text{FEM} - \text{CSR}) / \text{CSR} * 100\%$.

CSR Comparison (Updated on the last date of every month)					
Plant	FEM	CSR	GAP *	Description	Edit
WIH(WT)	799,043	0	-	-	
WKS-1(WT)	157,168	0	-	-	
WKS-5(WSD)	484,191	0	-	-	
WKS-6A(WSD)	3,523	0	-	-	
WKS-6B(WSD)	620,831	0	-	-	
WOK(WSD)	3,357,608	3,514,446	-4.5%	-	
WTZ(WSD)	1,611,919	2,397,567	-32.8%	-	
WZS-1(WT)	3,233,492	2,735,876	18.2%	-	
WZS-3(WT)	1,376,603	1,100,825	25.1%	-	
WZS-6(WT)	2,734,101	1,919,507	42.4%	-	
WCQ(WT)	1,561,554	2,832,129	-44.9%	-	

1 Electricity / Water: select to check data of electricity or water consumption.

2 Search for year and month: select year and month

3 Edit description: data description can be edited and added.



4 Update status light: different colors represent different update status

- White light: No data (no system)
- Green light: Data is up-to-date.
- Red light: Data is not updated.
- Yellow light: Data incorrect.



Data Maintain PIC

- Setting page of date sources and PIC: after editing or adding email account, system will send emails automatically.
- Include data sources of revenue and waste, more sources will be added in the future.

Data Maintain PIC					
Plant	Revenue (WT)		Waste		
	PIC	Remark	PIC	Remark	Edit
WKS-6A		-	raki_tan@wistron.com	-	
WKS-6B		-		-	
WZS-1	misaki_zeng@wistron.com	-		-	
WZS-3		-	raki_tan@wistron.com	-	
WZS-6		-		-	

- 1 PIC / Remark and Edit: PIC and remark can be edited and added, and system will send emails to these email accounts automatically.

Plant Change Log

- Change record of site status, including change of name, moving, and shut down.

Plant Change-log				
Change Type	Plant	After	Description	Change Date
Change of name	WKS-A	WKS-1	Name adjustment.	2022.01.07
Moving	WZS-8		Site re-open.	2021.12.30
Shut Down	WNH	WCD	Adjusted site arrangement.	2021.09.23

- 1 Change type, plant, change date and description.



Air Compressor Device

- Air Compressor Device AI Recommendation function is the integration of data science and device situation estimate in ECO system.

The screenshot illustrates the Air Compressor Device AI Recommendation process through five numbered steps:

1. Enter site / device number / maintenance expenses.
2. Enter new device SPEC, including lubrication, compression, operation type, rated power, rated displacement, rated efficiency, price, and brand / model.
3. After 1 2 are both completed, click “calculate” to get the result in 4 5.
4. Provide estimate and weekly performance of device efficiency and ROI.
5. Recommend back-up devices and new devices which have better efficiency and ROI than current device.

Key features shown include:

- Estimated Device:** Site: Fab12, Device Number: 6#, Maintenance Expenses: 0,000 NTD.
- New Device SPEC:** Lubrication: Oil, Compression: Centrifugal, Operation: VF Type, Rated Power: 250, Rated Displacement: 49, Rated Efficiency: 10.7, Price: 1,180,000, Brand / Model: Not required. Buttons: Save this SPEC, Calculate.
- Device Efficiency / ROI Info:** Table: Site: Fab12, Device Number: 6#, Year of Manufacture: 2012, Rated Power: 750, Rated Efficiency: 9.200, Estimated Efficiency: 8.501, Estimated ROI: 1.233.
- Device Weekly Efficiency Situation:** Line chart showing EER (Energy Efficiency Ratio) over time from 2/1 to 2/7, with values ranging from 7.8 to 9.5.
- Device Weekly ROI Situation:** Line chart showing ROI over time from 2/1 to 2/7, with values ranging from 3.0 to 4.5.
- Recommended Back-up Devices Info:** Table showing 5 backup device options with details like Year of Manufacture (2014), Rated Power (250), and Estimated ROI (1.552).
- Recommended New Devices Info:** Table showing 5 new device options with details like Lubrication (Oil), Compression (Centrifugal), and Price (1,180,000).
- Estimated Cost Reduction:** Line chart comparing cost reduction over 5 years for a Back-up device (blue line) and a New Device (yellow line).

This dialog box shows a list of saved device specifications:

No.	Lubrication	Compression	Operation	Rated Power	Rated Displacement	Rated Efficiency	Price	Brand / Model	Edit
1	Oil	Centrifugal	VF Type	250	49	10.7	1,180,000	-	
2	Oil	Centrifugal	VF Type	300	55	13.9	1,253,000	-	

Buttons: Import, Save.

- 1 Enter site / device number / maintenance expenses.
- 2 Enter new device SPEC, including lubrication, compression, operation type, rated power, rated displacement, rated efficiency, price, and brand / model.
SPEC info can be saved by clicking A. Click B to show all saved SPEC and edit in C, finally select SPEC and click D to import SPEC info.
- 3 After 1 2 are both completed, click “calculate” to get the result in 4 5.
- 4 Provide estimate and weekly performance of device efficiency and ROI.
- 5 Recommend back-up devices and new devices which have better efficiency and ROI than current device.

Select any one device in E F, there will be estimated cost reduction trend chart shown in G (blue line: back-up device, yellow line: new device).



Data Sources

Bo	WT	WT	WSD	WSD	WSD	WSD	WSD	WT	WT	WT	WSD	WT	WT	WT	WT	Corp.	Corp.
Plant	WIH	WKS-1	WKS-5	WKS-6A	WKS-6B	WOK	WTZ	WZS-1	WZS-3	WZS-6	WZS-8	WCQ	WCD	WMX	WCZ	WHC	WNH
Equivalent Production	DPM	DPM	DPM	-	DPM	DPM	DPM	DPM	DPM	DPM	X	DPM	DPM	X	X	X	X
Electricity	FEM	FEM	FEM	FEM	FEM	FEM	FEM	ElasticSearch (PowerMI)	ElasticSearch (PowerMI)	ElasticSearch (PowerMI)	FEM	FEM	FEM	X	X	CSR	CSR
Water	FEM	FEM	FEM	FEM	FEM	FEM	FEM	ElasticSearch (PowerMI)	ElasticSearch (PowerMI)	ElasticSearch (PowerMI)	FEM	FEM	FEM	X	X	CSR	CSR
Renewable Energy	-	FEM	FEM	FEM	FEM	FEM	-	FEM	FEM	FEM	FEM	-	-	-	-	-	-
Revenue	X	WiPBi	OPM	OPM	OPM	OPM	OPM	Manual update by Misaki	WiPBi	WiPBi	V	WiPBi	WiPBi	X	X	X	X
Manpower	X	-												X	X	X	X
Shipping	X	WiPBi	OPM	OPM	OPM	OPM	OPM	Manual update by Misaki	V	V	V	V	V	X	X	X	X
Waste	X	Manual update by Raki	CSR	CSR	Manual update by Misaki	Manual update by Raki	Manual update by Raki	Manual update by Raki	CSR	CSR	X	X	CSR	CSR			



FAQ

Q1: When is data updated?

A1: Data of every month is updated at 8:00 am on the 10th of the next month. Data of waste / scope1, WHC, and WNH is updated according to CSR update time.

Q2: Why does the data seem odd after the 10th of every month?

A2: Data will be updated on the 10th of every month. Missing data or problems of data sources might results in the odd data display (ex. without revenue, unit electricity and waste generation intensity cannot be calculated).

Q3: Why does system suggest missing data while data is not missing?

A3: As long as one of the items (water, electricity, revenue, unit electricity) data is incomplete, system will display missing data. However, you can always go to data update status on settings page to check for the data sources status.

Q4: Why does the data calculated by the system is different from that by myself? Who should I go to when I have suggestions or questions for the system?

A4: Please send emails to Emily Hsieh (CC Vincent Ku, Leo ZY Lin) to explain the questions. You will be contact.

Q5: Does the system backstage collect user data?

A5: Yes, user and usage will be collected by the system.