

Next-Generation Power-Saving Unit

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**ecomomo®**

**Dramatic power consumption reductions that  
go beyond conventional energy savings**



さつき株式会社



**SATSUKI CO.,LTD.**

Next-Generation Power-Saving Unit



**Dramatic reductions even for companies that have already significantly reduced their energy usage**

## Patented technology

\* Patent registered in 2018

This product has been patented as a "power improvement device." It is already in use in several thousand locations, primarily designated energy

\* Installation figures indicate number of usage sites

## Overall energy conservation proposals

Proposals are on an individual power transformer basis, making it possible to achieve energy savings across entire facilities.

\* 200 V and 400 V power

\* Power transformer with secondary voltage of less than 600 V

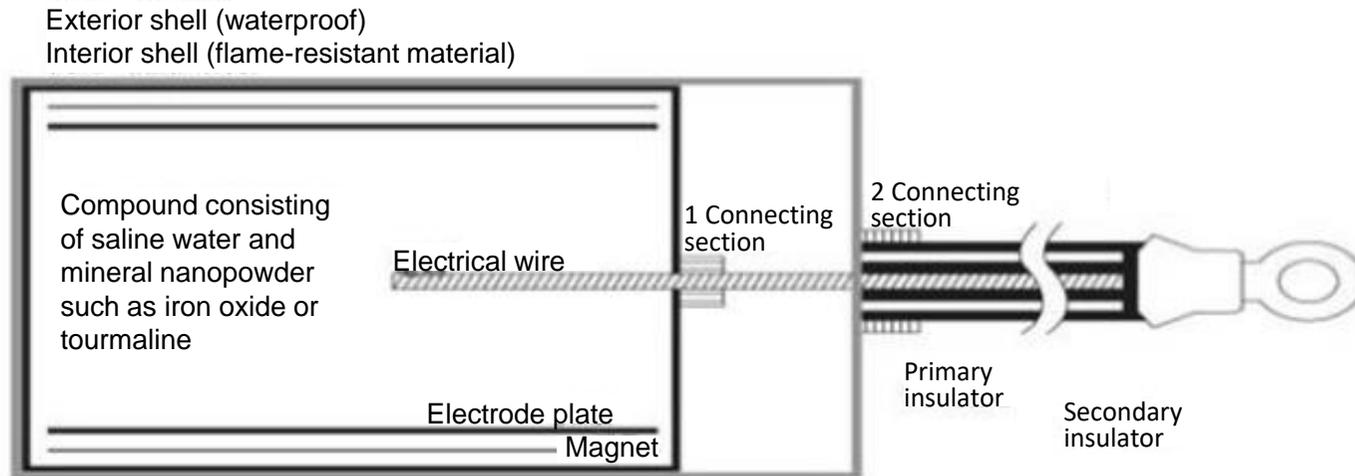
## Reduce power usage by 5% to 15%

\* Guaranteed minimum reduction of 5%

Power consumption can be reduced by 5% to 15% (based on past results). Up-front investment can be recouped in roughly three to five years.

**ecomomo units now qualify for tax incentives. \* Only available in Japan**  
**ecomomo units qualify for tax incentives as productivity-enhancing equipment. (Some conditions apply)**  
**Certificate issuer: Japan Machinery Federation**

# ecomomo's structure



## Tourmaline

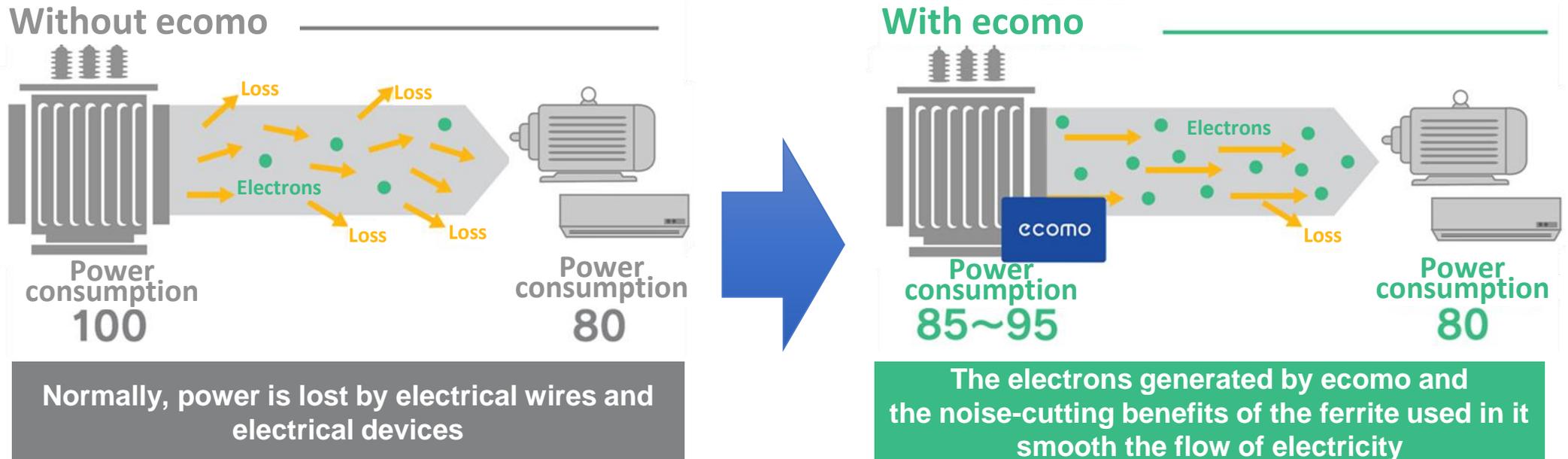
Tourmaline's Japanese name, "denkiseki," means "electrical rock." This unusual mineral gives off an ambient charge of 0.06 mA. It is said to produce electrons when stimulated.



## Ferrite

This magnetic material is a sintered compound consisting primarily of iron oxide mixed with cobalt, nickel, manganese, or the like. It is said to help eliminate noise.

# A new approach



Reduces power consumption by  
**roughly 5% to 15%**

\* Based on past results

\* Figures have been simplified for explanatory purposes.  
Actual results may differ.

# Patent overview

Issuer: Japan Patent Office

Type of publication: Unexamined patent publication bulletin (B2)

Patent no.: 6274523 (P6274523)

Registration date: January 19, 2018

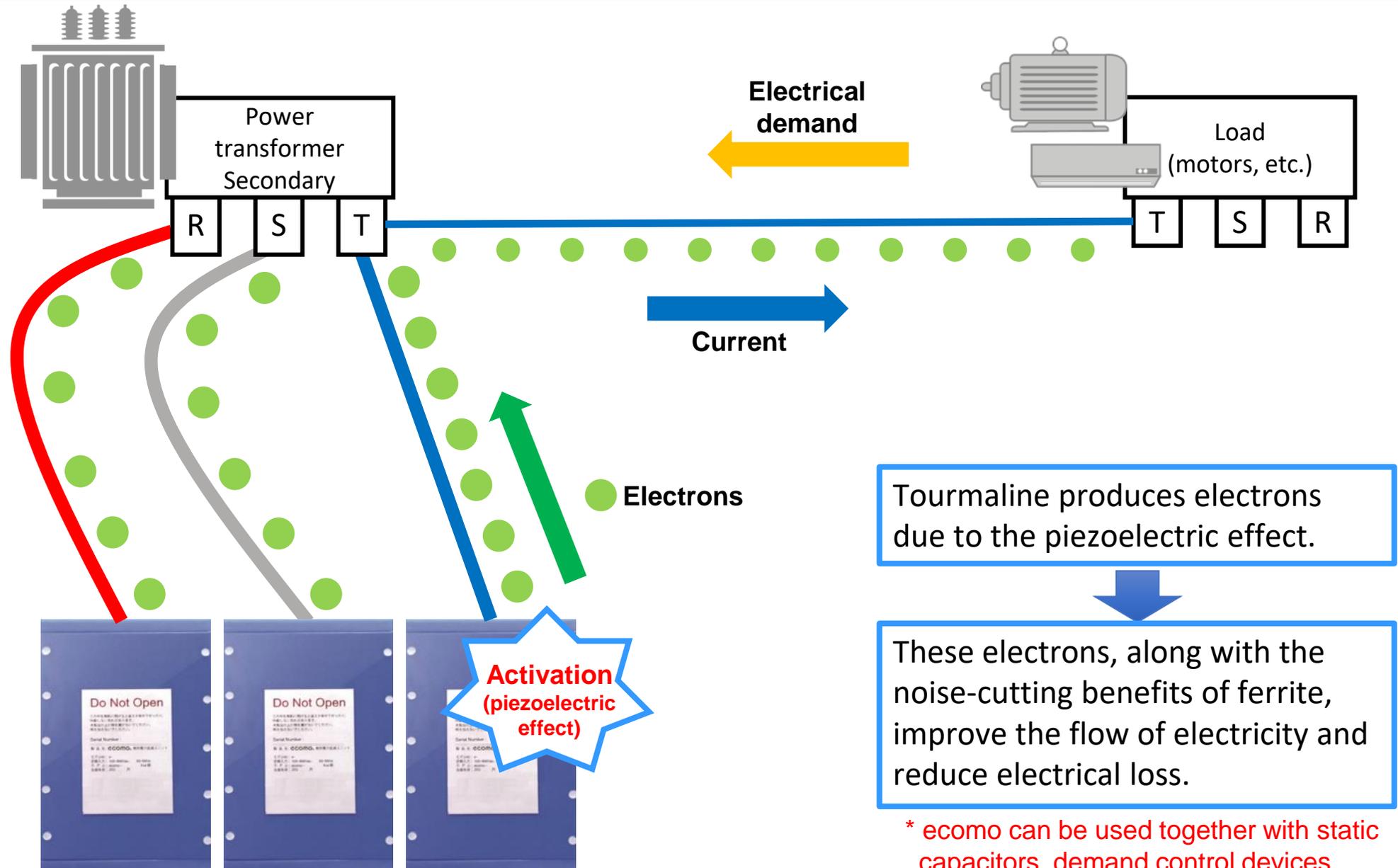
Publication date: February 7, 2018

Name of invention: Power improvement device

JP 6274523 B2 2018. 2. 7		
(18) 日本国特許庁(JP)	(12) 特許公報(B2)	(11) 特許番号 特許番号6274523号 (P6274523)
(45) 発行日 平成30年2月7日(2018. 2. 7)	(24) 登録日 平成30年1月19日(2018. 1. 19)	
(5) Int. Cl. F 1		
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最終頁に続く		
(54) 【発明の名称】 電力改善装置		
(57) 【特許請求の範囲】		
【請求項1】		
電流の流れの改善装置において、		
内側箱と、		
前記内側箱を覆う外側箱と、		
前記内側箱の中に混合される電気石及び酸化鉄の粉体からなる高誘電率の混合層と、		
前記混合層の中に配置した金、銀、又は銅からなる電極板と、		
磁気層を作り出す磁石と、		
前記混合層と装置の負荷に接続された電線と、		
を備え、		
前記混合層に塩水を含んでいる、		
ことを特徴とする電力改善装置。		
【請求項2】		
前記内側箱は導熱性の素材で形成され、前記外側箱は防水性の素材で形成されていることを特徴とする請求項1に記載の電力改善装置。		
【請求項3】		
前記電線が3相交流を供給する電源線に接続されることを特徴とする請求項1に記載の電力改善装置。		
【発明の詳細な説明】		

\* For details, please see the Japan Platform for Patent Information.

# How ecomo improves the flow of electricity



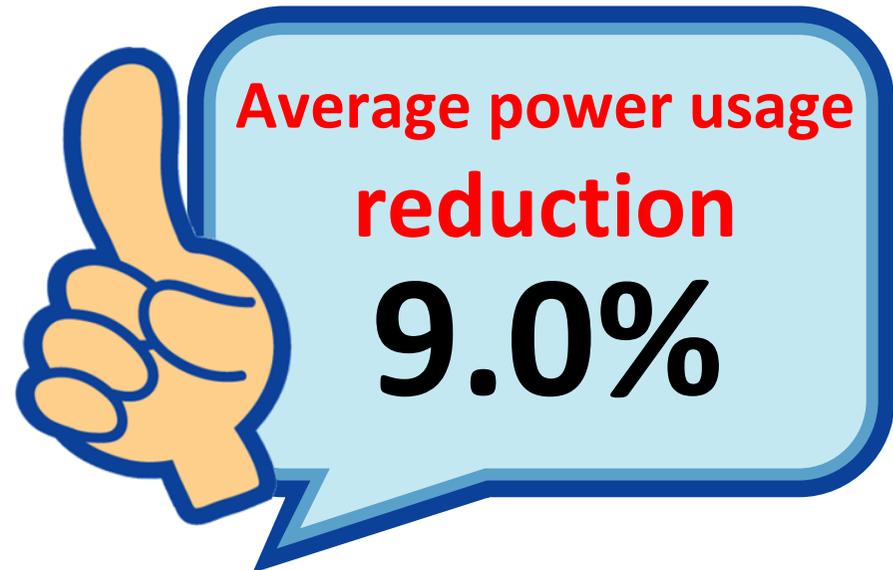
# Highly effective - Usage case 1

Deployment site : Company D, Osaka plant

Type of business : Chemicals plant

Installation date : October 2013

Capacity : 1250 kVA  
(750 + 500 kVA)



# Effectiveness verification 1 (Company D, Osaka site)

・ 検証方法②  
 J現場の生産ライン別、同品番のみの電力原単位、平均・最大電力量を設置前と比較  
 \*生産ラインは前月と同じ生産に近い(品番構成に近い)生産ラインである1号機、3号機、5号機とする

生産ライン別 電力原単位と平均・最大電力比較表 \*平均電力、最大電力は1時間あたりの電力量 (KW)

J現場 電力原単位と平均・最大電力量			1号機		3号機		5号機	
電力原単位 Power consumption rate	2013年11月	KWh/ton	515		210		127	
	2013年12月		466		206		110	
	前月比	%	-9.4%	-9.4%	-2.1%	-2.1%	-12.9%	-12.9%
	2013年11月	KWh/ton	528		203		127	
2014年1月	473		215		112			
前月比	%	-10.3%	-10.3%	6.1%	6.1%	-11.9%	-11.9%	
平均電力量 Average power usage	2013年11月	KWh	106		68		42	
	2013年12月		87		65		39	
	前月比	%	-17.8%	-17.8%	-3.3%	-3.3%	-8.6%	-8.6%
	2013年11月	KWh	101		68		42	
2014年1月	89		65		39			
前月比	%	-12.1%	-12.1%	-5.4%	-5.4%	-6.8%	-6.8%	
最大電力量 Maximum power usage	2013年11月	KWh	190		100		70	
	2013年12月		180		100		70	
	前月比	%	-5.3%	-5.3%	-0.0%	0.0%	-0.0%	0.0%
	2013年11月	KWh	180		100		70	
2014年1月	180		90		60			
前月比	%	-0.0%	0.0%	-10.0%	-10.0%	-14.3%	-14.3%	
12月-1月平均削減率		原単位 (%)			-6.7%		-6.7%	
		平均電力量 (%)			-9.0%		-9.0%	
		最大電力量 (%)			-4.9%		-4.9%	

Power consumption rate: Reduced by 6.7%

Average power usage: Reduced by 9.0%

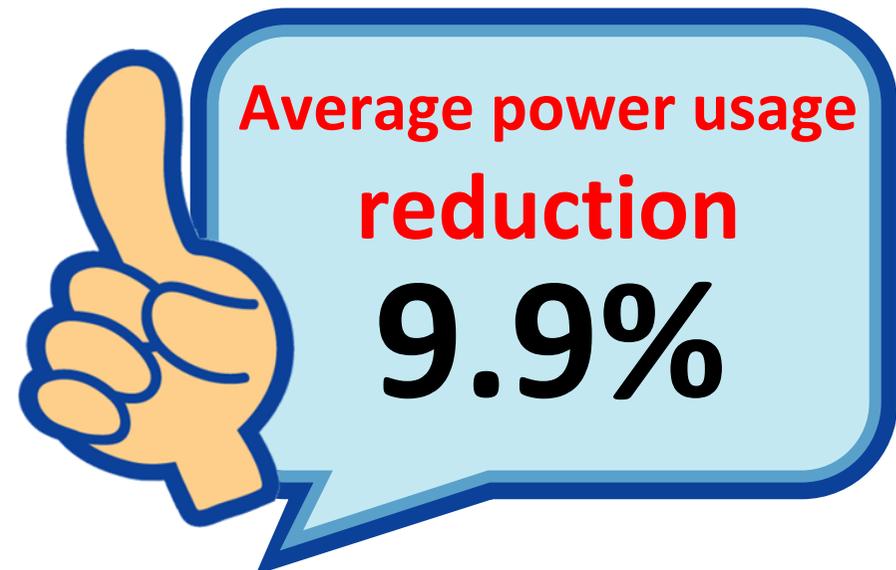
# Highly effective - Usage case 2

Deployment site : Company D, Chiba site

Type of business : Chemicals plant

Installation date : May 2015

C a p a c i t y : 750 kVA



# Effectiveness verification 2 (Company D, Chiba site)

Verification period: 6 months

Load: Agitators, ethyl acetate pumps, circulation pumps

Average reduction of **9.94%**

Comparison of reductions in average power consumption rates after ecom installation

						* Reference	
		Power consumption (kWh)	Production volume (t)	Average power consumption rate (kWh/t)	Reduction	Power consumption rate, same month, PY (kWh/t)	Year-on-year reduction
Before installing ecom	2014/5/1~2015/4/30			109.43			
After installing ecom	2015/10/1~10/31	140,890	1,441	97.76	10.66%	111.18	12.07%
	2015/11/1~11/30	115,620	1,174	98.50	9.99%	115.79	14.93%
	2015/12/1~12/31	107,380	1,026	104.67	4.35%	106.62	1.83%
	2016/1/1~1/31	127,870	1,264	101.19	7.53%	101.03	-0.16%
	2016/1/10~1/31	114,320	1,190	96.05	12.23%	100.57	4.49%
	2016/2/1~2/29	149,940	1,543	97.16	11.21%	109.83	11.54%
	2016/3/1~3/31	147,790	1,564	94.51	13.63%	106.03	10.86%
Average→					9.94%		7.94%

Analysis method (example): Power consumption rate · · · (Company D)

Figures show production efficiency in terms of how much energy was used per ton of production.

[Power usage (kWh) / production volume (t)]

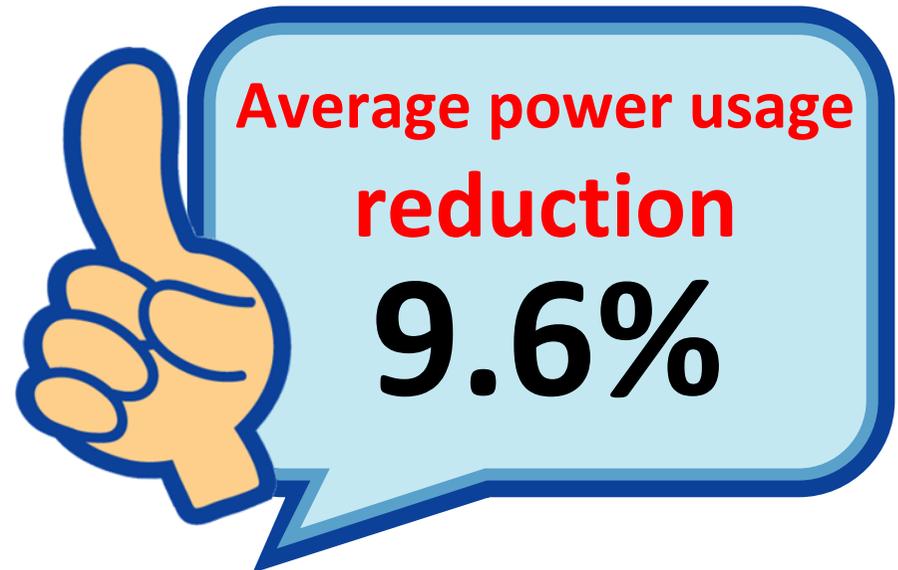
If it took 100 kWh of energy to produce one ton of product in the past, the power consumption rate would be 100.

If, after installing ecom, one ton could be produced with just 90 kWh of power, the power consumption rate would be 90 -- a 10% reduction in power usage.

Power consumption rates are often used for comparisons because the amount of power that is used will vary depending on production volume.

# Highly effective - Usage case 3

**Deployment site:** Major automotive manufacturer work site  
**Type of business:** Automobile component manufacturing company  
**Installation date:** February 2020  
**C a p a c i t y:** 300 kVA



# Highly effective - Usage case 4

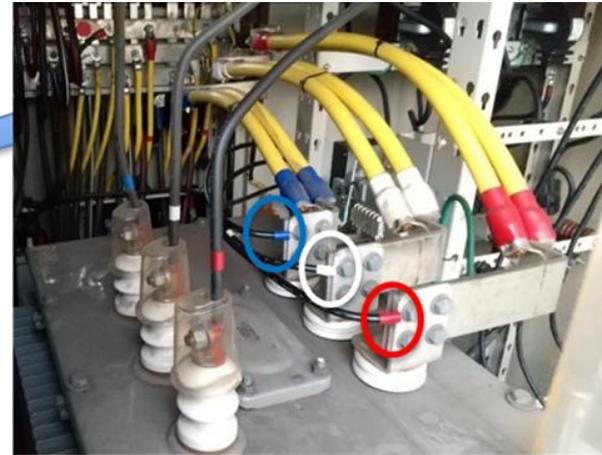
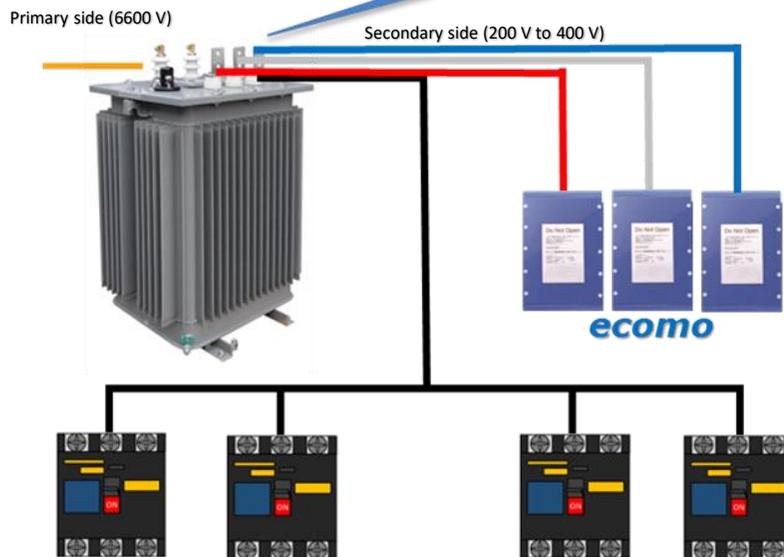
ecommo units are in use in several thousand other locations, primarily designated energy management factories.



# Easy to install

Installing ecomo is extremely easy.

Power is shut down during installation



Crimp terminals are used to connect the ecomo to the secondary side of the three-phase (R, S, T) transformer



\* Directly connects to the bus bar on the secondary side of the three-phase power transformer

Installation takes roughly one hour

# Product specifications

Select the model you need based on actual loads

When selecting the ecomos's capacity, it is best to choose an appropriate model based on average load placed on the transformer during normal operation, not the transformer's own capacity.

We can propose the most cost-effective model based on your power usage situation.

## Product specifications

Capacity	External dimensions (mm)	Connecting electrical wire	Weight
	Width x Height x Depth	Wire type/length	kg
30kVA(3-phase 3-wire, integrated)	300 × 170 × 140	CV14/2.7m	7kg
50kVA(3-phase 3-wire, integrated)	360 × 170 × 150	CV14/2.7m	9kg
100kVA(3-phase 3-wire, integrated)	320 × 200 × 160	CV14/2.7m	11kg
Our lineup of 150+ kVA ecomos are made-to-order. (Sizes are reference values)			
150kVA(3-phase 3-wire, separated)	(180 × 232 × 116) × 3	CV14/2.7m	17kg
200kVA(3-phase 3-wire, separated)	(190 × 272 × 142) × 3	CV22/2.7m	22kg
300kVA(3-phase 3-wire, separated)	(190 × 292 × 142) × 3	CV22/2.7m	33kg
400kVA(3-phase 3-wire, separated)	(180 × 332 × 152) × 3	CV38/2.7m	39kg
500kVA(3-phase 3-wire, separated)	(190 × 352 × 162) × 3	CV38/2.7m	43kg
750kVA(3-phase 3-wire, separated)	(240 × 442 × 152) × 3	CV38/2.7m	66kg
1000kVA(3-phase 3-wire, separated)	Order made		

Three-phase integrated unit



Three-phase separated units



\* Specifications are subject to change.

\* Actual sizes may differ by several millimeters due to manufacturing process.

Operating temperature range: -30 to 100°C

# Safe, reliable, and long-lasting

Current doesn't pass through the ecomo itself.

It's not an electronic device.

It contains no electronic components such as capacitors or IC chips that could degrade or fail.  
(The ecomo has a design service life of 15 years and a long 7-year manufacturing warranty)

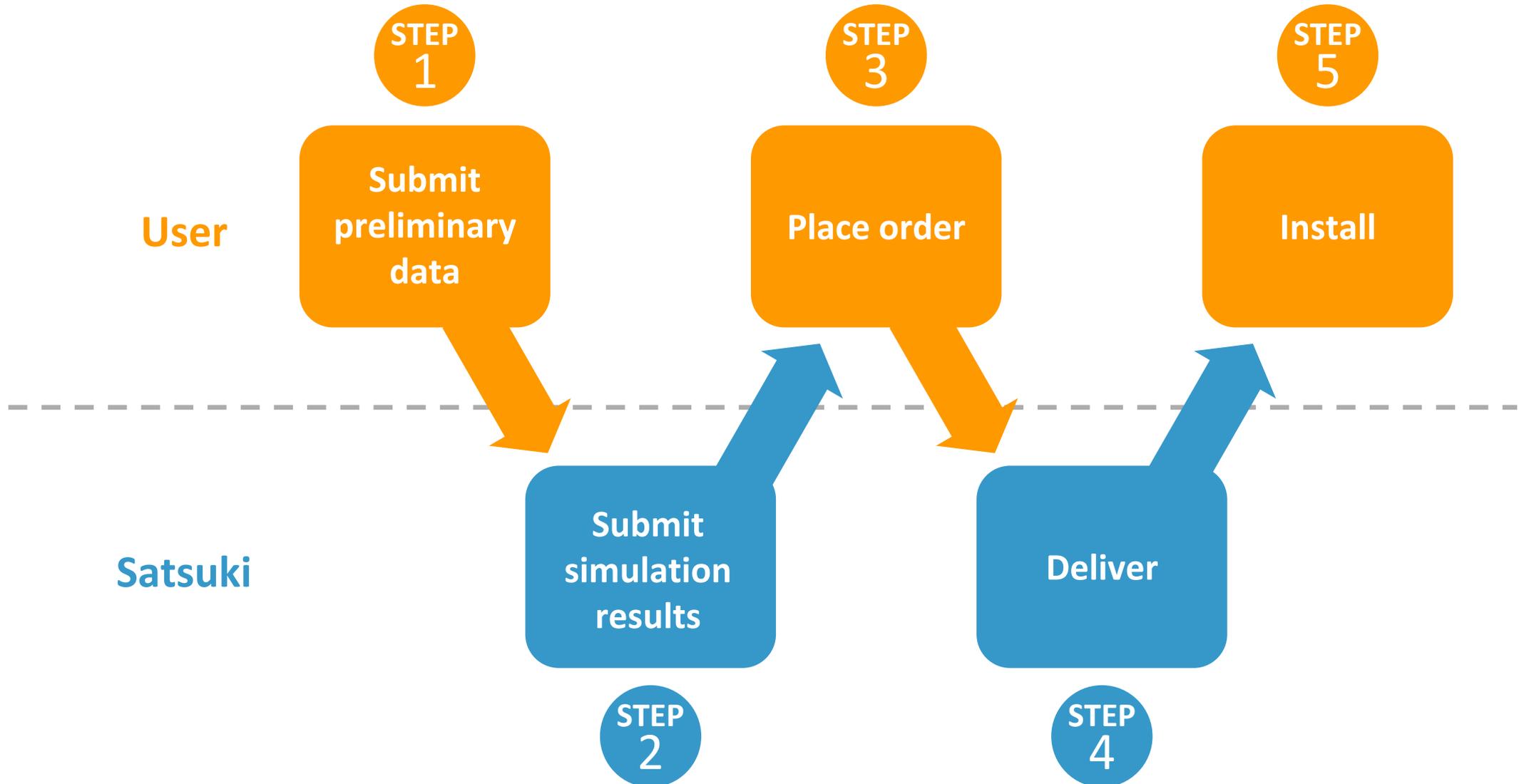
The interior of the ecomo is protected by acrylic resin coating.



The exterior case is made of cast nylon. It is highly insulated and durable.



# Deployment process



# Required simulation data (provided by customer)

## Two simulation information entry files

### Transformer information (capacity, type, voltage, current, etc.)

### Electricity usage information (metered power unit charge, past usage amounts, etc.)

Simulation information entry sheet (1) <span style="background-color: yellow;">* Fill out only yellow fields</span>					
Company Name		Satsuki Co., Ltd.			
Site Name		Osaka Plant			
Transformer Name	Transformer Capacity kVA	Transformer Type (Lighting or Power)	Voltage V (Avg.)	Current A (Operating Avg.)	Power kW (Operating Avg.)
No. 3 transformer facility No. 1 transformer	100	Lighting	101.0	30.0	
No. 3 transformer facility No. 2 transformer	750	Power	205.0	560.0	
No. 3 transformer facility No. 3 transformer	500	Power	204.0	920.0	
No. 3 transformer facility No. 4 transformer	300	Power	204.0	412.0	
No. 3 transformer facility No. 5 transformer	500	Power			200

Simulation information entry sheet (2) <span style="background-color: yellow;">* Fill out only yellow fields</span>		
Metered power unit charge for performing simulation		* Enter pre-tax amount 34.5 yen
Year and Month	Power Usage Over Past 12 Months (kwh)	Equivalent Metered Cost
2019	Jun	273,165kWh
	July	291,442kWh
	August	312,612kWh
	September	288,385kWh
	October	261,390kWh
2020	November	232,227kWh
	December	239,945kWh
	January	226,614kWh
	February	242,564kWh
	March	253,644kWh
	April	272,688kWh
	May	261,116kWh
Total		
Monthly Average		

# Simulation (example)

When eco units are installed for the entire facility

## Conceptual image of eco installation

Transformer	Capacity of installed eco units (KVA)	Transformer	Capacity of installed eco units (KVA)
No. 1 transformer facility No. 1 Lighting 100kVA	0	No. 3 transformer facility No. 1 Lighting 100kVA	0
No. 1 transformer facility No. 1 Power 200kVA	50	No. 3 transformer facility No. 1 Power 1000kVA	500
No. 1 transformer facility No. 2 Power 500kVA	200	No. 3 transformer facility No. 2 Power 500kVA	150
No. 2 transformer facility No. 1 Lighting 50kVA	0		
No. 2 transformer facility No. 1 Power 300kVA	100		
No. 2 transformer facility No. 2 Power 100kVA	30		
		Total	1030

*\* Total of 1,030 kVA of eco units installed on power transformer secondary side*

*\* Covers 91.0% of facility*

# Simulation (example)

When ecom units are installed for the entire facility

## Contents of proposal

Capacity of installed ecom units

1,030kVA

Cost

154,500 US \$

Predicted power savings

Calculate as:  
1 US dollar equals 160 yen

Power usage reduction (hypothetical)	Basis for calculation (monthly)	Annual expense reduction (¥) metered portion	Years to recoup investment (for metered portion alone)
3%	54,675 US \$ x 0.03 = 1,640 US \$	19,683 US \$ ( 1,640 US \$ x 12months)	7.8 years
5%	54,675 US \$ x 0.05 = 2,734 US \$	32,805 US \$ ( 2,734 US \$ x 12months)	4.7 years
6%	54,675 US \$ x 0.06 = 3,281 US \$	39,366 US \$ ( 3,281 US \$ x 12months)	3.9 years
7%	54,675 US \$ x 0.07 = 3,827 US \$	45,927 US \$ ( 3,827 US \$ x 12months)	3.4 years
8%	54,675 US \$ x 0.08 = 4,374 US \$	52,488 US \$ ( 4,374 US \$ x 12months)	2.9 years
9%	54,675 US \$ x 0.09 = 4,921 US \$	59,049 US \$ ( 4,921 US \$ x 12months)	2.6 years
10%	54,675 US \$ x 0.10 = 5,468 US \$	65,610 US \$ ( 5,468 US \$ x 12months)	2.4 years

The base cost is calculated based on the number of ecomos installed. The time to recoup investment is calculated based on the reduction in the cost of electricity for the metered portion alone.  
(Reductions to basic charges are not reflected in calculations)

\* Rounded to the first decimal place  
\* All monetary amounts are pre-tax amounts

Years to recoup initial investment (7%)	Annual power consumption reduction (7%)	Annual CO2 emissions reduction (7%)	Money saved over 15 year period (7%)
3.4 years	395,059kWh	178.6t	534,407 US \$

\* CO2 emissions reductions are calculated using FY2021 Tokyo Electric Power Company emission factor

# Simulation example for installation in 10 plants

Site	Transformer Capacity	ecom Capacity	ecom Price	Annual CO2 emissions reduction	Annual savings (7%)	15 year cumulative savings (7%)
Head Office Plant	4,000kVA	1,000kVA	150,000 US\$	200.00t	50,000 US \$	600,000 US\$
Plant No. 2	8,000kVA	2,000kVA	300,000 US\$	300.00t	87,142 US \$	1,007,130 US\$
Plant No. 3	10,000kVA	3,000kVA	450,000 US\$	400.00t	114,285 US \$	1,264,275 US\$
Plant No. 4	4,000kVA	1,000kVA	150,000 US\$	200.00t	57,142 US \$	707,130 US\$
Plant No. 5	9,000kVA	3,000kVA	450,000 US\$	500.00t	132,142 US \$	1,532,130 US\$
Plant No. 6	5,000kVA	1,000kVA	150,000 US\$	100.00t	28,571 US \$	278,565 US\$
Plant No. 7	8,000kVA	2,000kVA	300,000 US\$	400.00t	112,857 US \$	1,392,855 US\$
Plant No. 8	2,000kVA	500kVA	75,000 US\$	50.00t	17,142 US \$	182,130 US\$
Plant No. 9	4,000kVA	1,000kVA	150,000 US\$	200.00t	51,428 US \$	621,420 US\$
Plant No. 10	1,000kVA	100kVA	15,000 US\$	10.00t	2,857 US \$	27,855 US\$
<b>Total</b>	<b>55,000kVA</b>	<b>14,600kVA</b>	<b>2,190,000 US\$</b>	<b>2,360.00t</b>	<b>653,571 US \$</b>	<b>7,613,490 US\$</b>

Exchange rate used in calculations:  
1 US dollar = 160 yen

# How to fill in the information entry files (1)

## Two simulation information entry files

(1) Transformer information  
(capacity, type, voltage, current, etc.)

(2) Electricity usage information  
(metered power unit charge, past usage amounts, etc.)

Simulation information entry sheet (1) <span style="float: right;">* Fill out only yellow fields</span>					
Company Name		Satsuki Co., Ltd.			
Site Name		Osaka Plant			
Transformer Name	Transformer Capacity kVA	Transformer Type (Lighting or Power)	Voltage V (Avg.)	Current A (Operating Avg.)	Power kW (Operating Avg.)
No. 3 transformer facility No. 1 transformer	100	Lighting	101.0	30.0	
No. 3 transformer facility No. 2 transformer	750	Power	205.0	560.0	
No. 3 transformer facility No. 3 transformer	500	Power	204.0	920.0	
No. 3 transformer facility No. 4 transformer	300	Power	204.0	412.0	
No. 3 transformer facility No. 5 transformer	500	Power			200

Simulation information entry sheet (2) <span style="float: right;">* Fill out only yellow fields</span>			
Metered power unit charge for performing simulation		* Enter pre-tax amount 16.5 yen	
Year and Month		Power Usage Over Past 12 Months (kwh)	Equivalent Metered Cost
2019	Jun	273,165kWh	
	July	291,442kWh	
	August	312,612kWh	
	September	288,385kWh	
	October	261,390kWh	
2020	November	232,227kWh	
	December	239,945kWh	
	January	226,614kWh	
	February	242,564kWh	
	March	253,644kWh	
	April	272,688kWh	
	May	261,116kWh	
Total			
Monthly Average			

# How to fill in the information entry files (2)

## Two simulation information entry files

### (1) Transformer information (capacity, type, voltage, current, etc.)

Simulation information entry sheet (1)					
Company Name		Satsuki Co., Ltd.			
Site Name		Osaka Plant			
Transformer Name	Transformer Capacity kVA	Transformer Type (Lighting or Power)	Voltage V (Avg.)	Current A (Operating Avg.)	Power kW (Operating Avg.)
No. 3 transformer facility No. 1 transformer	100	Lighting	101.0	30.0	
No. 3 transformer facility No. 2 transformer	750	Power	205.0	560.0	
No. 3 transformer facility No. 3 transformer	500	Power	204.0	920.0	
No. 3 transformer facility No. 4 transformer	300	Power	204.0	412.0	
No. 3 transformer facility No. 5 transformer	500	Power			200

\* Fill out only yellow fields

**Current and power values**  
Enter the average current and average power when each transformer is operating at normal levels.

# How to fill in the information entry files (3)

## Two simulation information entry files

### (2) Electricity usage information (metered power unit charge, past usage amounts, etc.)

Simulation information entry sheet (2) \* Fill out only yellow fields

Metered power unit charge for performing simulation \* Enter pre-tax amount  
16.5 yen

Year and Month		Power Usage Over Past 12 Months (kwh)	Equivalent Metered Cost
2019	Jun	273,165kWh	
	July	291,442kWh	
	August	312,612kWh	
	September	288,385kWh	
	October	261,390kWh	
	November	232,227kWh	
2020	December	239,945kWh	
	January	226,614kWh	
	February	242,564kWh	
	March	253,644kWh	
	April	272,688kWh	
	May	261,116kWh	
Total			
Monthly Average			



# Next-Generation Power-Saving Unit

# ecommo®

Reducing energy usage is a vital task for companies, a responsibility they bear towards future generations.

We want to work together with companies that also feel this way to achieve this goal.

## Inquiries:

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