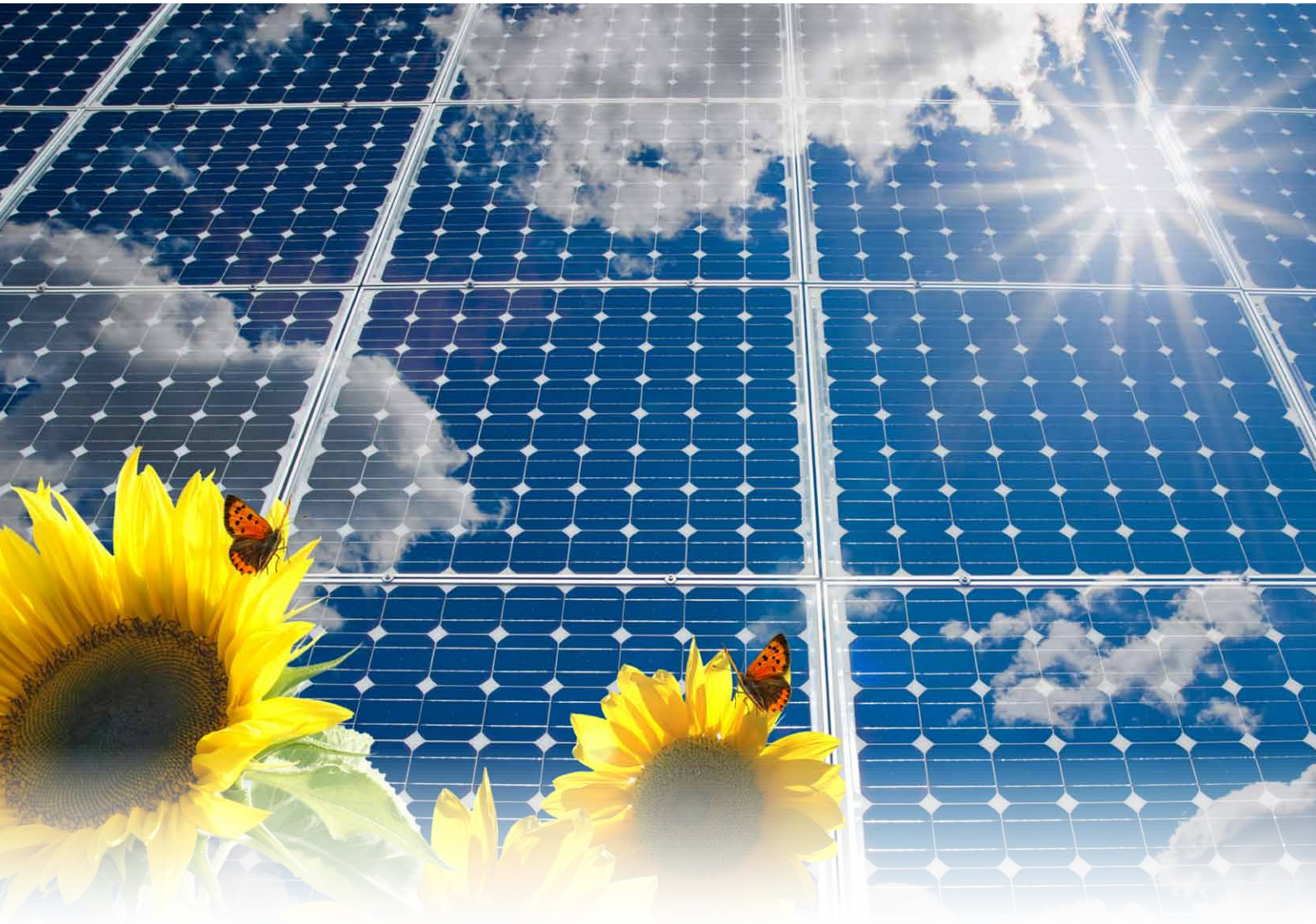




Saves Your Energy

Enclosing solutions for the solar energy industry



Ensto Industrial Solutions

Ensto Industrial Solutions

for demanding environments

We are known in the industry for designing and manufacturing standard and customer-specific enclosing solutions and electromechanical products for demanding industrial environments.

We are professionals in providing customer-specific enclosing solutions targeted at demanding environments. We are a reliable partner with an experienced design department. We keep to schedule and offer excellent customer care. We also have sound knowledge of a wide range of materials.

Why Ensto

- Highly experienced design department
- Innovative personnel with technical expertise
- Knowledgeable in photovoltaic energy industry applications
- Specialists in injection moulded customer-specific solutions
- A modular tooling structure for our standard thermoplastic enclosures, enabling cost-efficient mould modifications
- Modern production facilities with the state-of-the-art robot technology in Estonia and Finland
- Assembly service
- Sourcing of third party components
- Reliable and flexible deliveries with special packaging possibilities

Standard products

Our standard product range includes thermoplastic, polyester, sheet steel and aluminium enclosures and the related accessories. These are supported by a broad selection of terminals and load break switches used by global manufacturers.

The polycarbonate used is UV resistant, self-extinguishing and halogen free. The material also has the UL Plastic Recognition Yellow Card.

Our thermoplastic enclosures have a modular tooling structure, enabling cost efficient mould modifications of any side of the enclosure.



Solutions for high demands

Our solutions typically have a high degree of protection (IP66/67). We have also developed solutions meeting IP69K. We work closely with standardizing and testing bodies, with certifying products according to customer needs.

Our service offering

Our service offering includes the customisation of standard enclosures as well as the creation of tailor-made new enclosing solutions based on the customers' product projects. We also offer assembly services as well as the sourcing of third party components.

We are experts in product design and development and offer totally tailor-made solutions, including smooth technical documentation, 3D modelling and quick prototyping.

Solutions for the solar industry

We have created a range of applications for the solar energy industry. Deeply familiar with your segment, we are able to offer you technical solutions meeting your needs.

Ensto's role in the photovoltaic segment includes products such thermoplastic customized and pre-assembled combiner boxes for solar plants, a variety of enclosing systems such as for power and string control purposes, as well as generator junction boxes.

Renewable Ensto

“Who would have thought two years ago that one of the biggest business segments would be photovoltaic?” asks Tomi Gardemeister, President of Ensto Industrial Solutions, surrounded by the growth his business unit has experienced in renewable energy.

Gardemeister says Ensto's Industrial Solutions unit grew more than 30 percent last year, and the wind and solar energy sectors by more than 50 percent. “There are even some product areas in the renewable sector such as inverters and combiner box systems – which are growing as much as 150 percent.”

The growth is thanks to what Gardemeister refers to as “the megatrend of sustainable development” which is fuelled by big European countries’ subsidies to move their energy consumption away from fossil fuels.

But Gardemeister sees potential beyond Europe, as well. “China and India are focusing on sustainable energy. In a couple of years there will be the biggest renewable markets. And the American market is an opportunity, too!”

In wind, Ensto is involved both in metal and thermoplastic enclosure solutions, including applications such as control boxes, node boxes, and de-icing systems for heat sensor conditions to name a few.

Ensto customers who are a part of this growth in sustainable energy are those who manufacture wind gear, turbines, as well as project partners for wind power plant providers and large system integrators. Gardemeister names Enel Ener and Ferret Shovel as two of Ensto's key customers and major players in the renewable field.

“One of the reasons why we've decided to focus on this segment,” says Gardemeister, “is that Ensto already has the materials and technologies which make us very competitive in this business. Our offering is good already, and we don't have to heavily invest or learn totally new things. Also, our new REX product launch will enlarge our offering to these segments in the coming years.”

Despite the fact that the sustainable business is currently dependent on subsidies, Gardemeister is still optimistic. “We believe there will be a little uncertainty,” he says, “as it's still a business highly dependent on subsidies, and those will someday end. But there is no question that long-term this is a significant opportunity.”

“And,” adds Gardemeister, “it is fully consistent with Ensto's vision. We are on the front line of producing clean, recyclable, innovative, and sustainable products.”

Who would have thought two years ago that one of the biggest business segments would be photovoltaic?

Tomi Gardemeister
President, Ensto Industrial Solutions

“Who would have thought two years ago that one of the biggest business segments would be photovoltaic?” asks Tomi Gardemeister, President of Ensto Industrial Solutions. Read the whole article from our customer magazine, Ensto Today 2011, www.ensto.com.



We are a member of the German Solar Industry Association and China Photovoltaic Society

Customer-specific enclosing solutions

Customised enclosing solutions



- Machining such as cutting, drilling and threading according to customer's drawings



- Silk screen printing



- Colour service



- Mechanical assembly



- Customer-specific sizes

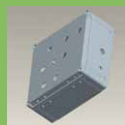


- Offering an online tool for fast configuration and a short lead-time

Tailor-made enclosing solutions



- Feasibility studies



- 3D modelling, prototyping & technical documentation



- Mould sourcing & maintenance



- Manufacturing of customer-specific special tools



- Sub-assembly testing and certification



- Quality documentation and coordination audits

Integration services



- Mechanical assembly



- Electromechanical assembly



- Hardware and software integrations



- Testing including e.g. environmental and functionality testing



- Sourcing of third party components



- Logistics & quality assurance

Elements of solar installations

Net coupled roof installations



2. Fire switch box
Ensto Cubo S and D series



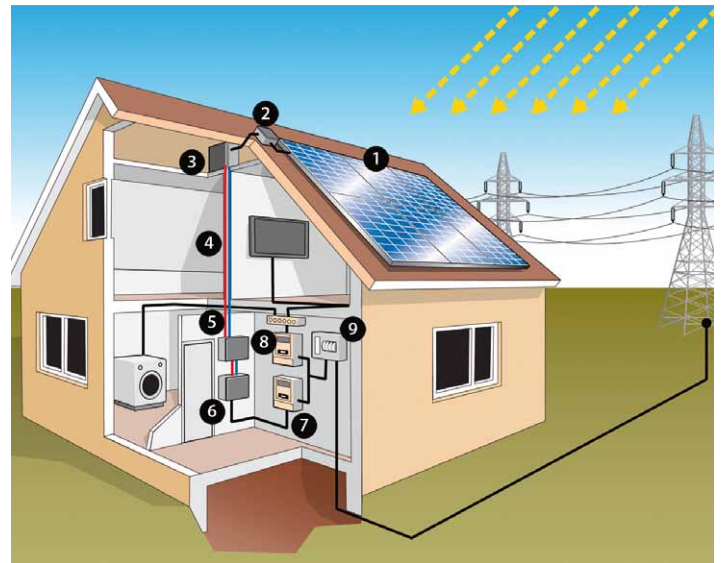
3. Combiner box
Ensto Cubo S series



5. Generator junction box
Ensto Cubo O series



7. Distribution board
Ensto Cubo P series



- | | |
|---------------------------|-----------------------|
| 1. Solar modules | 6. DC Inverter |
| 2. Fire switch | 7. Distribution board |
| 3. Combiner box | 8. User |
| 4. DC main string | 9. Public net |
| 5. Generator junction box | |

Net coupled solar plants



2. Combiner box
Ensto Cubo O and N series



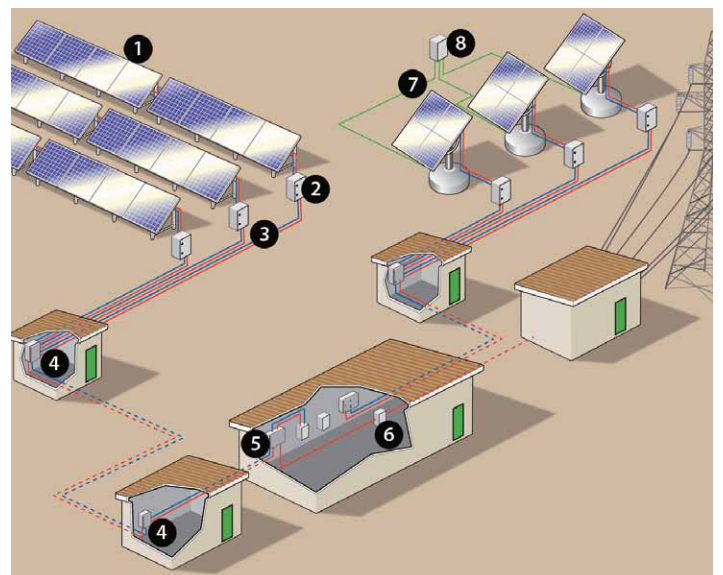
4. Array junction box
Ensto Cubo O and N series



5. Generator junction box
Ensto Cubo O series



7. Tracker control
Ensto Cubo N and E series



- | | |
|-----------------------|---------------------------|
| 1. Solar modules | 5. Generator junction box |
| 2. Combiner box | 6. Central inverter |
| 3. DC string | 7. Tracking system |
| 4. Array junction box | 8. Tracker control |

Ensto Cubo D enclosures

Ensto Cubo D enclosures in brief:

- Can be used as a fire switch box
- Small polycarbonate and ABS enclosures dimensioned according to the European Norm enclosures
- Includes fastening pods inside the cover
- Has slots in the base for printed circuit boards
- Available accessories include e.g. mounting plates, DIN rails, hinges and fastening lugs.



WIDTH (MM)	HEIGHT (MM)	DEPTH (MM)	INNER DEPTH (MM)
53	55	36	27,5
	63	36	25,0
80	82	56	42,0
		86	72,0
	120	56	42,0
		86	72,0
	160	56	42,0
86	72,0		
120	122	56	42,0
		86	72,0
	160	91	77,5
	200	86	72,0
150	200	76	62,0
160	240	91	77,5
		121	107,5
230	300	86	72,5
		111	97,5

Conformity	
PC enclosures:	CE RoHS (E) UL cUL GL
Technical information	
Degree of protection:	IP 66/67
Impact resistance:	PC: IK 08 (-25 °C... +35 °C)
Flammability rating:	PC: UL 746C 5V
Material	
Base/cover:	Polycarbonate
Cover screws:	Stainless steel
Gasket:	PUR (polyurethane)
Knockout alternatives	
PC enclosures:	Plain sides/ customer-specific knockouts
Standard colour	
Base:	Grey RAL 7035
Cover:	Grey RAL 7035 or transparent

Ensto Cubo S enclosures

Ensto Cubo S combiner boxes in brief:

- Specially developed for the solar industry
- Sizes 175 x 175 x 75/100 mm
- Can be used in building installations of smaller family houses
- Can be used for indoor as well as outdoor installations
- The smoke-grey transparent cover protects the assembly from UV radiation
- Pre-mounted breather BPA10H prevents condensation
- Provides the maximum amount of knock-outs for M16 glands as well as the possibility for a second breather BPA10H



SPCM181808S



SPCM181810S

Conformity	
CE RoHS	
Technical information	
Degree of protection:	IP 66/67
Impact resistance:	IK 08 (-25 °C... +35 °C)
Flammability rating:	UL 746C 5V
Material	
Base:	Fibreglass reinforced polycarbonate
Cover:	Polycarbonate
Cover screws:	Fibreglass reinforced polyamide
Gasket:	PUR (polyurethane)
Knockout alternatives	
Metric knockouts	
Standard colour	
Base:	Grey RAL 7035
Cover:	Smoke-grey transparent

Ensto Cubo S enclosure in brief:

- Made of ABS or polycarbonate
- Available with plain sides or knockouts (metric or Pg)
- Available in 36 sizes, two base depths (25 and 50 mm) and 5 different cover heights
- Cover and cover screws equipped with sealing holes
- Has slots in the base for printed circuit boards
- Available accessories include mounting plates, DIN rails, hinges and fastening lugs



Ensto Cubo S enclosures are small and convenient to be used as e.g. fire switch boxes.

WIDTH (MM)	HEIGHT (MM)	DEPTH ALTERNATIVES (MM)
75	125	35 / 50 / 60 / 75 / 100 / 125
100	100	35 / 60
125	125	35 / 50 / 60 / 75 / 100 / 125
	175	35 / 50 / 60 / 75 / 100 / 125 / 150
	250	125
175	175	75 / 100 / 125 / 150
	250	75 / 100 / 150

Ensto Cubo O and C enclosures

Ensto Cubo O and C enclosures in brief:

- Can be used in roof installations and solar plants
- Can be used for indoor as well as outdoor installations
- Customer-specific knock-outs
- Possibility for a smoke-grey transparent cover that protects the assembly from UV radiation
- Possibility to mount breathers to prevent condensation

WIDTH (MM)	HEIGHT (MM)	DEPTH (MM)	INNER DEPTH (MM)
200	200	132	115.0
		187	170.0
	300	132	115.0
		187	170.0
	400	132	115.0
		187	170.0
300	300	132	115.0
		187	170.0
	400	132	115.0
		187	170.0
	600	132	115.0
		187	170.0
400	400	132	115.0
		187	170.0
	600	132	115.0
		187	170.0

Conformity



Technical information

Degree of protection: IP 66/67
 Impact resistance: IK 08 (-25 °C... +35 °C)
 Flammability rating: UL 746C 5V

Material

Base: Fibreglass reinforced polycarbonate
 Cover: Polycarbonate
 Cover screws: Fibreglass reinforced polyamide
 Gasket: PUR (polyurethane)

Knockout alternatives

Ensto Cubo O: Plain sides / customer-specific knockouts
 Ensto Cubo C: Flange knockouts

Standard colour

Base: Grey RAL 7035
 Cover: Grey RAL 7035, transparent or smoke-grey



Our Cubo O enclosures are suitable for various applications, such as for surge protection solutions or DC disconnects. These enclosures are available in various sizes with custom cut-outs or knockouts, optionally with mounted cable entries.

Ensto Cubo P panel building system

Ensto Cubo P panel building system in brief:

- Includes a base part with four totally open sides
- Base part available in 4 sizes
- Open construction in the assembly stage; easy access from all directions
- Easy and quick assembly of bases and plates with the help of quick release pins
- Easy to modify and extend into larger assemblies
- All parts are reusable
- Wide range of accessories available



Our offering includes Ensto Cubo P panel building system made of polycarbonate. It is suitable for large assemblies as well as for smaller entities.

Conformity

PC enclosures: CE, RoHS, ENEC, PSE

Technical information

Degree of protection: IP 65

Material

Base: Fibreglass reinforced polycarbonate
 Cover: Polycarbonate
 Cover screws: Fibreglass reinforced polyamide
 Gasket: PUR (polyurethane)

Knockout alternatives

PC enclosures: Totally open sides

Standard colour

Base: Grey RAL 7035
 Cover: Grey RAL 7035 or transparent

Ensto Cubo N wall cabinets

Ensto Cubo N wall cabinets in brief:

- Can be used in roof installations and solar plants
- Can be used for indoor as well as outdoor installations
- Quick fixture guides in the back that permit fitting without drilling.
- Built-in surrounding protection edge guarantees the possibility to open the door 180° in built-in installations and also prevents entrance of water while opening the door
- Vertical patterns in the interior of the door enables the correct fitting of devices

WIDTH (MM)	HEIGHT (MM)	DEPTH
250	300	140
300	400	200
400	400	200
400	500	200
400	600	230
500	600	230
600	800	300

Conformity	
Technical information	
Degree of protection:	IP 66
Impact resistance:	IK 10
Flammability rating:	UL 746C 5V
Material	
Base/cover:	Fibreglass reinforced polyester
Lock:	Double bit DIN 3.0 mm
Gasket:	PUR (polyurethane)
Knockout alternatives	
	Plain sides / customer-specific knockouts
Standard colour	
Base:	Grey RAL 7035
Cover:	Grey RAL 7035



All our enclosures can be pre-machined to save installation costs.



Using internal door with a transparent window is a good solution for the fixing of signal and measurement elements.



Ensto Cubo N polyester cabinets are available with grey cover or cover with a window.

Ensto Cubo E wall cabinets

Ensto Cubo E wall cabinet in brief:

- Available in 31 sizes
- Customer-specific dimensionings also available in small volumes at competitive prices
- The door can be opened 110°
- The door can easily be changed from right to left-hand hinged
- Wall cabinets made of stainless steel AISI 316 available on request



Conformity	
Steel enclosures:	
Technical information	
Degree of protection:	IP 66, with two doors IP 55
Impact resistance:	IK 09 (-25 °C... +35 °C)
Material	
Base/door:	Polyester painted mild steel or stainless steel AISI 304
Gasket:	PUR (polyurethane)
Mounting plate:	Galvanized steel
Locks:	Chrome plated zinc die in painted enclosures, AISI 304 or 316 in stainless steel enclosures
Hinges:	Stainless steel
Knockout alternatives	
Painted:	Flange openings
Stainless steel:	Plain sides / customer-specific knockouts
Standard colour	
Painted:	Grey RAL 7035

Legal notice

The information in this brochure is to the best of Ensto's knowledge and belief correct and reliable. We reserve the right to make changes in the specifications, materials and production methods without further notice. Be aware of that you have to evaluate independently the suitability of each product for the intended application. Ensto does not give any assurance of any particular quality or performance. Our responsibilities for the products are set forth in the "Orgalime S 2000 General

Conditions for the Supply of Mechanical, Electrical and Electronic Products". The products shall be installed only by a competent person having nationally required knowledge. Ensto is not responsible for its distributors or for any misuse, incorrect installation or ignored national safety or other national provisions.

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Ensto

Ensto is a family business and international cleantech company specializing in the development, manufacture and marketing of electrical systems and supplies for the distribution of electrical power as well as electrical applications. We are committed to lasting sustainable development and our goal is to be the world's leading company in green energy efficiency and distribution. Our products, manufactured in seven different countries, are environmentally friendly, energy efficient and leave a minimum carbon footprint. Ensto has three key business units: Ensto Utility Networks, Ensto Industrial Solutions, and Ensto Building Technology.

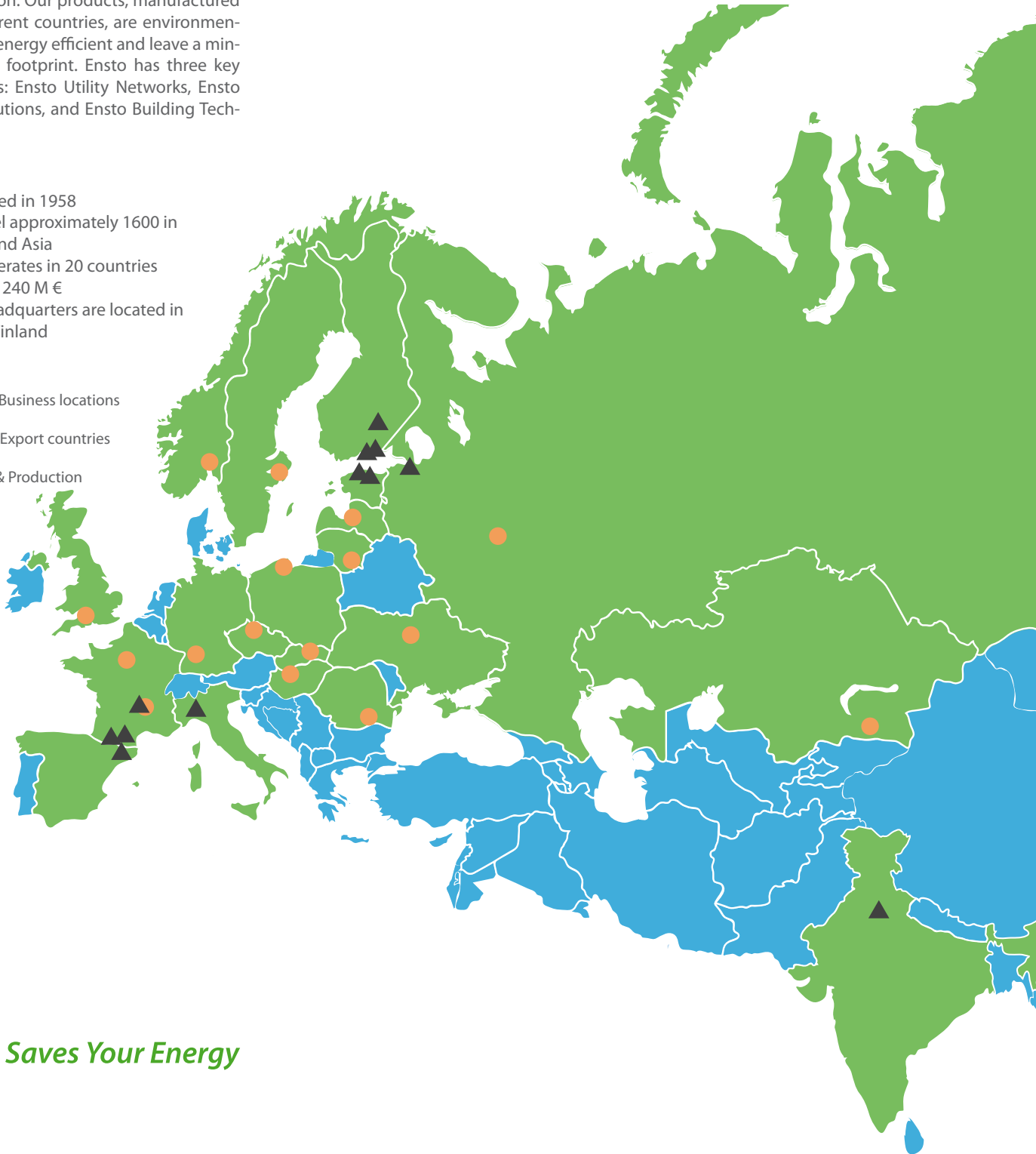
Cleantech

Cleantech means all those products, services, processes and technologies which prevent or reduce impacts of harmful actions on environment. Cleantech stands for better quality, efficiency and profitability. Ensto and other Finnish cleantech companies are already at the top of the world in several key cleantech sectors.

Facts

- Established in 1958
- Personnel approximately 1600 in Europe and Asia
- Ensto operates in 20 countries
- Turnover 240 M €
- Ensto headquarters are located in Porvoo, Finland

-  Ensto Business locations
-  Other Export countries
-  Sales & Production
-  Sales



Saves Your Energy

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