FIMER

INVERTER FOR LIFE

Solar Division

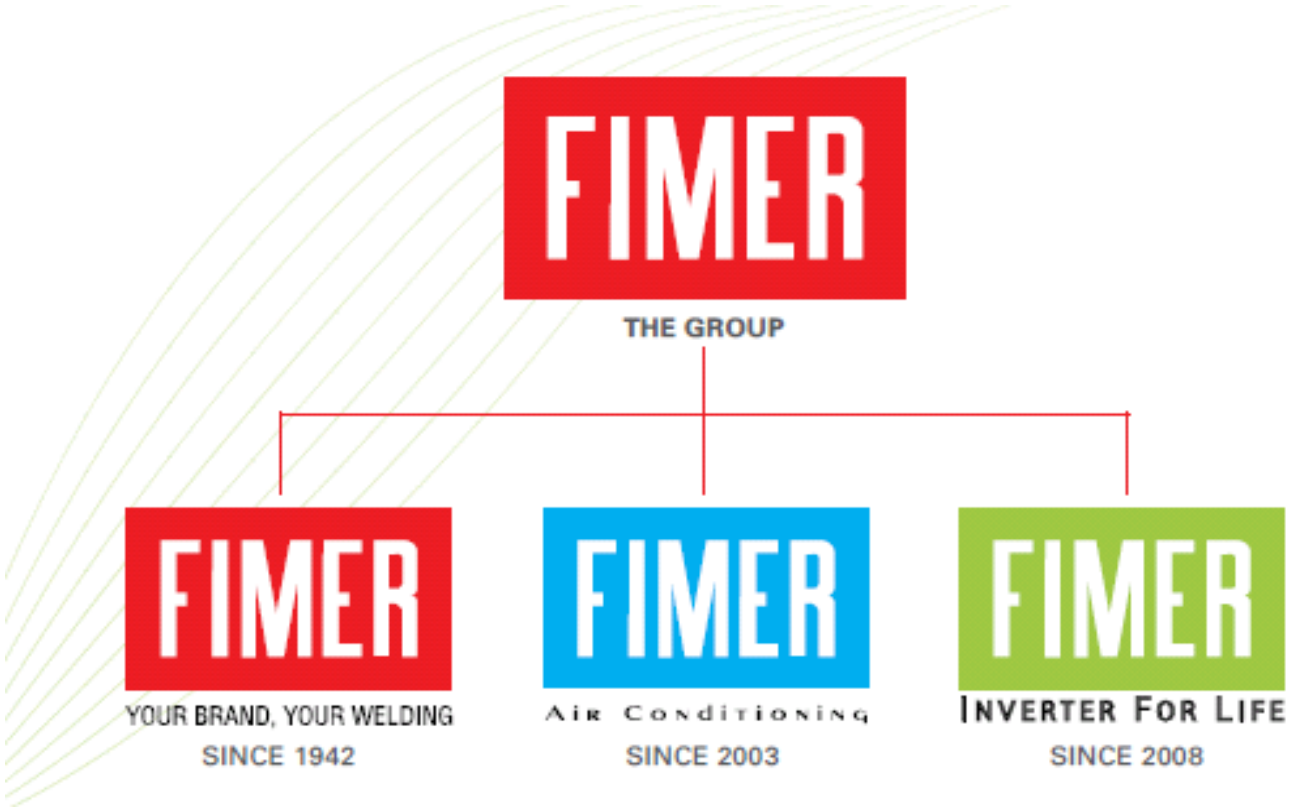
ON GRID SOLAR INVERTERS:

String Inverter

Central Inverter

MEGA STATION

THE COMPANY



Three Divisions, One Family Company

THE VISION

Join forces… this is the keystone!

FIMER
INVERTER FOR LIFE

In today's world **the essential thing is to sacrifice personal needs**. Companies must meet the increasing market demand to have a complete service that relieves customers of any worry about the investment they made or are about to make.

The keystone is to join forces, to find synergies along the entire supply chain that leads to customer satisfaction, **so that more and better services can be provided with less effort for each person involved**.

Everybody must do what he is able to do and he must do it well, keeping every commitment taken.

Filippo Carzaniga
Business Development Director

AWARENESS OF BEING UNIQUE

FIMER
INVERTER FOR LIFE

Awareness of being unique…

The world of renewable energy has opened a universe of possibilities; it has been able to create a new concept of safe and clean Energy disconnected from all the critical issues that affect the traditional energy sources.
Being able to imagine a different environment means offering to people who work in this area a unique opportunity: **to create business while preserving our surroundings, to create wealth without harming the environment.**

FIMER enclosed all this in its DNA, and the company was established in 1942 already following these principles that have been kept also when manufacturing its PV Inverters today.

EVERYTHING STARTED 70 YEARS AGO … THE FUTURE IS HERE…

FIMER

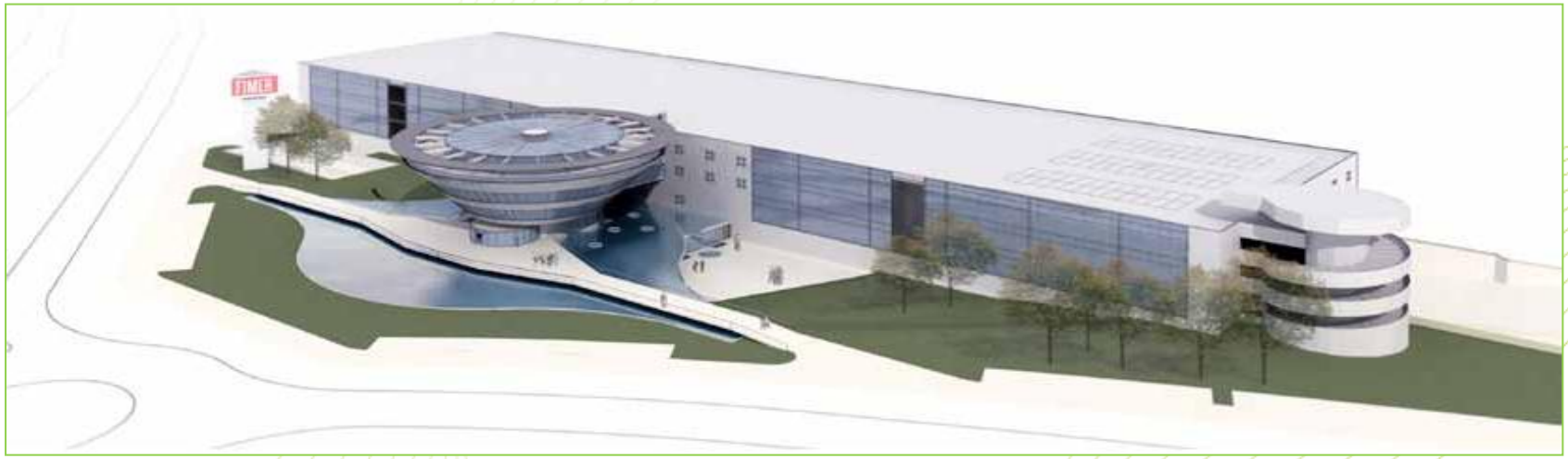
INVERTER FOR LIFE

Everything started 70 years ago… the future is in front of us

FIMER, established in 1942, has increasingly focused its attention on product innovation, first with the development of Welding (1942), with higher technology, than with air conditioners (2003), a unique product and finally with the development of photovoltaic inverters (2008) that could grant the best performances on the market.

Our experience in the inverter technology is highly proven. FIMER was the first company applying the technology of power inverter in industry and developing the first Inverter operated welding machine in the world in 1983.
This long experience has allowed us developing PV Inverters with a patented technology (the **Modular Power System) that <u>can increase energy production by more than 11%</u> compared to any other inverter in the market**

THE NEW FIMER HEADQUARTER



In September 2012, the new Head Quarter of FIMER SpA will be operating; an establishment of **34.000 sqm** and **3.800 sqm** of Offices and Facilities will be “up and running”, where all the production activities and R&D will be present.

This will make the new Head Quarter, the first of this size in Lombardy **TOTALLY CARBON FREE**

FIMER HQ has an installed roof mounted PV plant of 960 kW

Thanks to this new Head Quarter we will increase our Production capacity up to 600 Mw/year

ONE GIGAWATT PROJECT

FIMER, EXCLUSIVE INVERTER SUPPLIER OF

"One Giga Project"

The World's Largest PV Plant of 1GW Power that will rise in the Republic of Serbia.

Installations will start end of 2012

FIMER will supply n.500 MEGASTATION 2000 (2 Mw each)

PRODUCTS RANGE

MICRO INVERTER

250 Wp

"1PH" STRING INVERTER

da 1,5 a 6,6 Kwp

"3PH" STRING INVERTER

da 10 a 18 Kwp

CENTRAL INVERTER "BT"

da 40 a 150 Kwp

CENTRAL INVERTER "MT"

da 150 a 500 Kwp

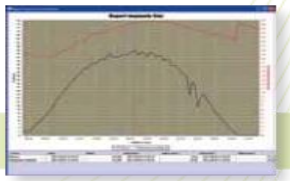
MEGASTATION

da 500 a 1500 Kwp

SMART STRING BOX

da 4 a 24 stringhe

MONITORING SYSTEM



INVERTER & FIELD ACCESSORIES

THE PRODUCT TODAY …
THE **STRING INVERTERS**

THE <u>STRING</u> INVERTERS

After 3 years of development FIMER presents its best single-phase and three-phases string Inverters: the “C” series.

This extremely comprehensive range of products is composed by **8 models:**

- **C 20 – C 25 – C 35 – C50 – C65 (1PH) with powers that start from 1,5 Kwp and go up to 5,5 Kwp**
- **C 100 – C 130 – C 160 (3PH) with powers that start from 10 Kwp and go up to 15,5 Kwp. All inverters are IP 65 (protection degree for external use)** and do include **a RS 232 ports and two RS 485 interfaces** for the communication of the dates and the data-logging.

All models are already equipped with differential and a display for the visualisation of the data **The shell is entirely aluminium made** ultra strong and the ventilation of the electronic components is natural (no use of fans subject to failures)

Beside the C three-phase series, FIMER still presents the “R” string inverter three phase series with 3 MPPT with nominal power of 12,00 kW (**R 120**) and 14,40 kW (**R 150**).

The warranty can be extended to **<u>20 years</u>**

FIMER solar converters: **RELIABILITY AND HIGH PERFORMANCES.**

FEATURES AND PLUS
String Inverters

FIMER
INVERTER FOR LIFE

Features and “plus” String Inverters

- High efficiency: **> 96%**
- INTEGRATED Interface Device
- LCD Display for data reading
- 2 INTEGRATED RS 485 interfaces
- 1 INTEGRATED RS 232
- LEDS for alarms and operating status
- 20 YEARS WARRANTY extension
- Network monitoring and operating status
- Protection against OVERVOLTAGES
- Monitoring of ground fault
- Monitoring of current Dispersion
- Intervention granted in **48 hours**
- Delivery in **72 hours**

THE PRODUCT TODAY …
CENTRAL INVERTERS

<u>The central FIMER inverters are unique in the world!</u>

Our machines have considerably improved the 3 main important aspects for a Central SOLAR INVERTER:

- **Performance: MORE THAN 11% HIGHER ENERGY PRODUCTION)**
- **Elimination of machine downtime**
- **Longer product life**

These results were achieved **through the introduction of the "FULL MODULAR" technology (FIMER patent),** where not only the electronic components are modular, but all the components inside the machines are modular, including the micro-electronic, the transformers, the inductances.

CENTRAL INVERTERS
Fimer's **ADVANTAGES** 1/3

What are the advantages of such a technology?

1 HIGHER ENERGY PRODUCTION by more than 11% on average compared to other monolithic inverters

This happens thanks to the multi-modularity of the entire machine: **our central inverters starts generating energy at only 700 W**!!!

A multi-module inverter with a single MPPT configuration **generates more energy**: thanks to this system, the power modules of our inverters switch on in stages and are ALREADY ABLE TO PRODUCE ENERGY with few power from the photovoltaic field.

Our single module of 40 or 50 KWp starts to convert energy (to produce energy) when there is presence of **only 700Wp** from the photovoltaic field (basically from the first ray of sunlight).

A monolithic inverter of equal power will begin to supply power only when reaching about 6/7% of rated power (eg. 100Kwp an inverter will turn on only the achievement of 6-7KWp).

CENTRAL INVERTERS
Fimer's ADVANTAGES 2/3

HIGHER ENERGY PRODUCTION: 11,47% more Energy from FIMER Central Inverters

*Assuming at least (only) 10 minutes switching on earlier in the morning and switching off later (Turning off the inverter in the evening, follows the same mechanism) without considering the production of energy in low-radiation (**the FIMER inverter would produce anyway**), the result is that a FIMER Central inverter generates **at least 2000 hours** more than the competitor's central inverters (over 20 years).*

Cost Comparision between FIMER R1200 inverter and inverter "S" and "A" in the first 5 years of in 5 years of operation

Central Inverter of 120 kWp (100 kW) Net Metering service related to the FIT legislation "Conto Energia 2011" divided in 3 FIT

	Additional costs	*Inverter cost*		*Additional costs*	*Inverter cost*		*Additional costs*	*Inverter cost*
		Inverter S 125kw			Inverter A 125kw			Fimer R1200
Price List		€ 44.500			€ 50.800			€ 41.200
Net Standard Price		€ 20.000			€ 20.726			€ 21.310
Net Last Price		**€ 16.910**			**€ 17.800**			**€ 18.500**
To which you need to add:								
Warranty Extention to 5 years	€ 2.670	€ 19.580		€ 850	€ 18.650		none	€ 18.500
Data Logger	€ 1.000	€ 20.580		€ 200	€ 19.550		none	€ 18.500
Final Net Price		**€ 20.580**			**€ 18.850**			**€ 18.500**

The multi modularity of the FIMER inverter with 3 MPPT (Master/Slave configuration), allows to convert (produce) at least 10% more energy (official data is 11,47%) compared to single IGBT module competitors. and single transformer.
This allow the system to produce also with low currents (FIMER Inverter will start up anyway), Low radiations and the auto-consuption of energy is always reduced to minimum.

AFTER 5 YEARS OF OPERATION: calculations done on the basis of 150 days per year, 6 hours of working at maximum convertion rate (max power of 100kw energy injection into the Grid, (Conto Energia 2011)

Total Production in kW	405.000			405.000		450.000	
Revenues with FIT 0,358/KW [A]		€ 144.990,00			€ 144.990,00		€ 161.600,00
Revenues with FIT 0,341/KW [B]		€ 138.105,00			€ 138.105,00		€ 153.450,00
Revenues with FIT 0,323/KW [C]		€ 130.815,00			€ 130.815,00		€ 145.350,00
By deducing the Central Inverter Value we have following revenues:							
Revenues on 5 Years production [A]		**124.410,00**			**126.140,00**		**143.100,00**
Revenues on 5 Years production [B]		**117.525,00**			**119.255,00**		**134.950,00**
Revenues on 5 Years production [C]		**110.235,00**			**111.965,00**		**126.850,00**
						+6%	Of NET PROFIT in comparision to Inverter S
						+9%	Of NET PROFIT in comparision to Inverter A

CONCLUSIONS

The FIMER inverter could be in some instances more expensive in comparision with some competitors (which often operates only on price based policy). This GAP will be immediately recovered within the first 5 years of operation and will be adding much more profits in the remaining 15 years of operation.

CENTRAL INVERTERS
Fimer's ADVANTAGES 3/3

What are the advantages of such a technology?

2 Elimination of machine downtime

Thanks to the "FULL MODULAR", you will NEVER Experience a Full Block of the Energy conversion…this risk has been brought nearby to "0".

By using a multi - modular power system such as FIMERS's one, in the event of a fault, **it is unlikely to experience the block of the total system**: our inverter has three completely separate conversion lines (R1200/R1500); in the unlike event, the block could be related only to the power section of one 40/50 KWp parallel line, while the other operating power modules will take care of the power module failure; the power will in case be dispensed.

3 Longer product life

As far as the longer life of the product is concerned, our machines are at the top !

The modules switch on and off in a balanced way, with a full electronic control, until the machine reaches its maximum power.
This allows having the electronic components working at lower temperatures (and therefore lasting longer time) and it reduces the consumption of the fans used for cooling, increasing performances.

FEATURES AND PLUS
Central Inverters

FIMER
INVERTER FOR LIFE

Features and “plus” Central Inverters

- **MPS System (modular power)**
- High efficiency**: > 96% (> 98% x TL)**
- 4+4 Relay Outputs
- INTEGRATED Data logging
- 2 INTEGRATED RS 485 interfaces
- 1 INTEGRATED RJ 45 Ethernet Interface
- DISPLAY TFT TOUCH 4,3’’
- 5 YEARS basic WARRANTY on the product
- Network monitoring and control of the Stand alone operating
- Protection against OVERVOLTAGES
- Monitoring of ground fault
- Monitoring the loss of insulation
- Extension of the **Warranty up to 20 years**
- Intervention granted in **48 hours**
- Protection against Polarity Inversion

OTHER ADVANTAGES of FIMER'S CENTRAL INVERTERS

FIMER
INVERTER FOR LIFE

Thanks to the modularity one can manage from 1 to 6 MPPT with a single machine (depending on the model).

This feature allows dividing the PV field into subfields or managing more independently more roof pitches into roof applications.

This feature provides two main advantages:

ECONOMIC: only one machine that handles more MPPTs is definitely cheaper than more machines managing one subfield each.

SPACE: in terms of space, a single machine certainly occupies less space than multiple machines.

THE MEGASTATION

THE FIMER's MEGA STATION

FIMER has developed a range of **complete** power station for the production of energy suitable for large solar power plants.

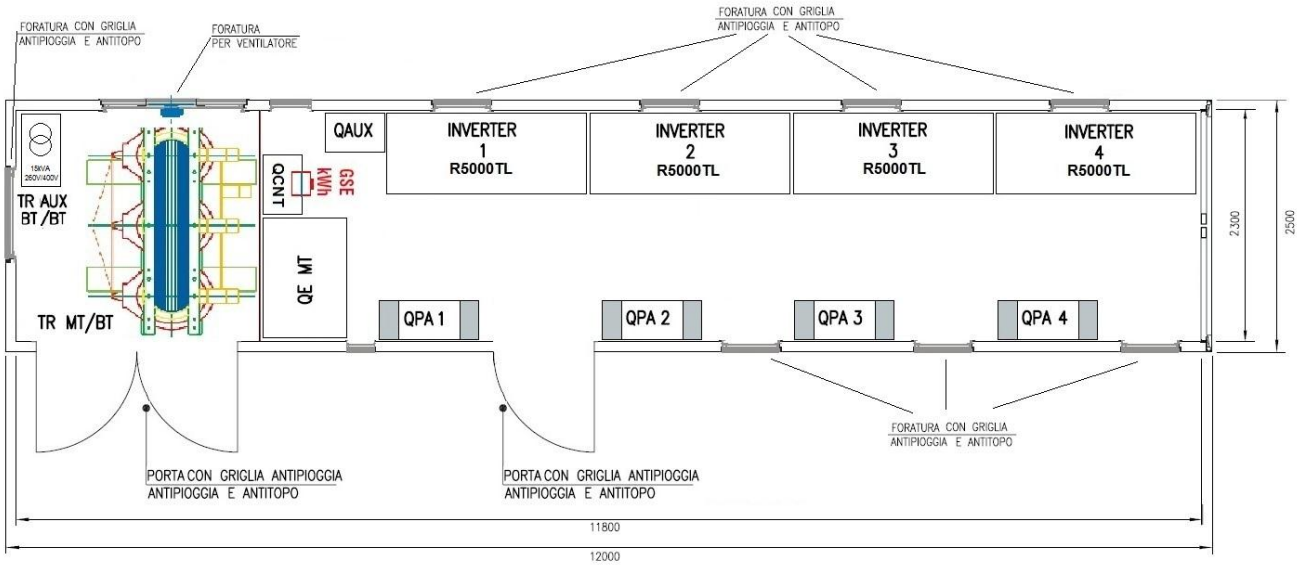
The FIMER MEGASTATION, unlike similar products, are real "PLUG AND PLAY " units; these include all components required to connect the solar power plant to the grid without having additional hidden costs of components required but not provided.

Our Stations, in sizes of 500 – 750 – 1000 – 1300 – 1500 – 2000 Kwp include all:

- ***Inverters***
- ***Parallel panels***
- ***Main Low Voltage panels***
- ***Medium Voltage Cell***
- ***Transformer***
- ***Router and Monitoring***
- ***Solar and Radiation sensor***
- ***Fan systems of the transformer***
- ***Meters and Isolators***
- ***Ventilated Cabin***

THE MEGASTATION

Indoor Layout 2 MW MEGASTATION designed for the 1 GW Project in Serbia



Snapshots: 2 MW MEGASTATION

SOME INSTALLATIONS Q1 2012

Biella (BI) – Italy 800 kW

Pereto (AQ) – Italy 3,5 MW

Padova (PD) – Italy 1,2 MW

Gorizia (GO) – Italy 1,6 MW

Trento (TN) – Italy 450 kW

Kozani – Greece 120 kW

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INVERTER FOR LIFE

Thank you for attention and

..... Enjoy the sunshine!!!