



**The Leading Provider of Technical Operations
Services to Photovoltaic Power Plants**

- ❑ The Strategic Relevance of O&M Service
- ❑ The Solar O&M Market Scenario
- ❑ TOPS Energy and the INDITEL Group
- ❑ TOPS Energy – The Third Party Maintainer
 - Service Offering
 - Customer Targets
 - Advanced Delivery Model
 - Knowledge, Operational Excellence, Independence and Flexibility
- ❑ TOPS Energy - Your Strategic Partner for O&M and technical services to PV Plants

The Strategic Relevance of O&M Service Quality



Already in the early years of operations, rather all the owners of PV plants had the chance to **appreciate the impact of O&M on the cash flow generated by their PV plants**

- Even more, the long term sustainability of the PV plant performances is strictly dependent on the inherent quality of O&M activities and on the real incentives of the O&M contractor to pursue long term performances
- The mission of the O&M contractor is to provide the owner of a PV plant with the best possible support in:
 - ✓ Maximizing the **availability of the PV plant**
 - ✓ Identifying areas **of improvement of the plant efficiency** in order to improve the PR, and consequently the overall energy production
 - ✓ Ensuring **hidden defects**, which might even only have long term effects, are **promptly identified and corrected** (possibly before the expiration of product and performance warranties)

These goals are typically conflicting with the interest of the EPC contractor having built the PV plant, who may then be called to correct the deficiencies at its own cost.

The Solar O&M Market Scenario

The market of solar O&M contractors is currently highly fragmented, characterized by a number of players having started O&M on the plants they built as EPC contractors as a pure opportunity, while **lacking a proper and professional organization and infrastructure to adequately perform O&M services**

- Most of the O&M providers are lacking a **dedicated and professional** organization and infrastructure to properly perform O&M services
- O&M contracts were erroneously seen by the EPC contractors as a **cash-cow business** where, by simply dedicating some junior resources for the on-site tasks, they can enjoy a long term attractive earnings and cash flow
- Once into operations (normally already during the initial 6-12 months of operations) there has been **significant evidence of the inadequacy of many of the EPC** contractors that entered into the O&M field in an opportunistic manner and whose organization is definitely lacking the required organization and infrastructure and technical/managerial specialist skills
- A growing number of former EPC and current O&M contractors are experiencing **significant financial stress putting at risk their long term survival**

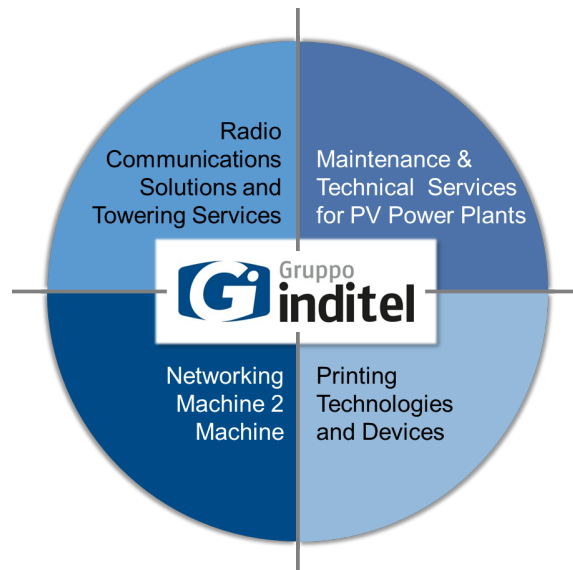
Like it has happened in other maturing sectors, **a limited number of specialized Third Party Maintainers** (TPM - independent from the EPC contractors and manufacturers) **will consolidate the PV O&M market** leveraging on their ability to provide **high quality and cost effective services**

TOPS Energy is part of the Inditel Group

To address the PV O&M market, **Inditel group has created TOPS Energy** - a specialized provider of installation and maintenance services across Italy for the renewable energy sector

TOPS Energy benefits from:

- ✓ the **50-year history of the INDITEL group** in the maintenance and support of advanced technologies and distributed equipment installations
- ✓ its **service mentality and customer dedication**
- ✓ its **organization, skills, set of tools and specialized information systems**
- ✓ its **financial strengths and balance sheet**



- Specialized provider of solutions and support/management services to the Telecom and Radiocom industries since 1962, having started a specific service offering to the Energy sector since 2008
- A total turnover of 25m€ and 250HC, out of 15 branch offices spread across Italy, with the Central Head Offices located near Milan
- ISO 9001 certified processes and service delivery organization
- Reliable partner since 50 years of world-class customers like ENI, Banca d'Italia, Vodafone, Wind, BT, etc...

TOPS Energy - The Third Party Maintainer of PV Plants

TOPS Energy (Technical Operations Services) is the leading Independent and Specialized Provider of O&M and Technical Services to Utility Scale PV Plants, ensuring the best quality level and overall energy production performances

Independent Third Party Maintainer

- Full enforcement of EPC contract guarantees: when the EPC contractor performs itself also O&M services, there is the risk of a "hidden agenda" as he will protect himself refraining whenever possible the disclosure of PV plant construction pitfalls
- An independent O&M provider ensures "no mercy" to EPC contractor in the analysis of PV plant performances and identification of required corrective actions
- Independence from any specific manufacturer or EPC facilitates the establishment of the required support agreements with all the key technology providers

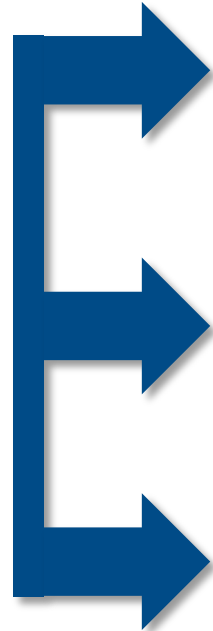
Specialized on Technical Support Services: we are dedicated to O&M and technical support services and will succeed or fail depending on our ability to deliver superior results and quality

- Advanced service organization infrastructure, tools and methodologies devoted to O&M activities
- Investment in dedicated infrastructure (such as the Central Control Room), which are critical to ensure real-time control and monitoring of the plants
- Specialized Central Technical support, backed in case of need by resources from the original equipment manufacturer
- Dedicated IT tools with advanced features for the real-time management of contract committed SLA
- Size and specialization facilitate riding the learning curve and the achievement of economies of scale, which are then passed over to final customers as increased skill set and lower unit costs



Tops Energy - The Market Targets

TOPS Energy provides technical support services to three different targets within the Solar sector



**Utility Scale
PV Plants
(>500kWp)**

- Full scope customized O&M services, including Availability or PR guarantee
- Dedicated organization, if applicable
- Upgrade or retrofit of PV generator, security or monitoring system

**Small-Medium
PV Plants
(<500kWp)**

- Packaged O&M services from full flexibility to fixed price (FLEX, SMART or RELAX)
- Upgrade or retrofit of PV generator or monitoring system
- Local presence and interventions all over Italy

**Manufacturers
of key sub-systems
and components**

- On-site & on-center Warranty repair interventions
- Spare parts and repairs logistics
- New product activation
- Swap and install
- Retrofit campaigns (sw-hw)

*Inverters
Modules
Monitoring solutions
Security systems*



TOPS Energy - O&M Service Offering for Utility Scale PV Plants



Based on the long lasting experience in the management of PV plants and provision of O&M services in various sectors, TOPS has structured a complete O&M offering to address any recurrent and one-off need of large scale PV plants

O&M Service Offering		
	Service	Frequency
1	Taking over of the PV plant	
2	a. Front Office and Technical Support	daily
	b. Reporting	monthly
3	Data Acquisition and Monitoring	daily
4	Functional check on field	monthly
5	Scheduled Maintenance	half-yearly
6	Corrective Maintenance	as required
7	a. Spare Parts Logistics	ongoing
	b. Provision and Repair of Spare Parts	as required
8	Surveillance and site security	daily
9	a. Green Area Maintenance	as required
	b. Modules Cleaning	as required

- TOPS has the required skill set and organization **to address all the requirements of a PV plant during its whole life-cycle**
- The **long lasting experience** and **know-how** of the world leader **independent manager of PV solar plants**
- The service offering is **modular and tailored to the specific requirements of each customer and of each plant**. O&M activities scope-of-work and frequencies are highly dependent upon site-specific features, environment and equipment durability characteristics, and upon a cost-benefit trade-off
- Subject to the technical assessment of the plant construction and component quality and of past performances, the contract can include **a growing level of guaranteed performances:**
 - ✓ Guaranteed **Reaction Time**
 - ✓ Guaranteed **Plant Availability**
 - ✓ Guaranteed **Performance Ratio**
- The contract is based on a predefined **annual fee**, which includes all the preventive maintenance activities and the corrective maintenance related to technical failures of the Plant
- Full assistance** in case of any **extraordinary events** (even if experience teach that thefts and unexpected events are unfortunately not so extraordinary)

TOPS Energy - O&M Service Offering for Small-Medium PV Plants



Small-medium PV plants have different requirements and need to be approached with a standardized set of services, capable of addressing both the technical and administrative requirements of a PV plant, but preserving a light and flexible cost structure

<i>Offering</i> <i>Proposed Services</i>	FLEX (PV plants <100kw)	SMART	RELAX
Monitoring and alarm mgmt	Possible if plant is equipped with monitoring system	Included	Included
Preventive maintenance	Preferential tariff	Included	Included
Corrective maintenance * • "Right to Call" cost • Labour <i>* Customer pays spare parts cost</i>	Preferential tariff	Preferential tariff	Included
Plant check-up	Preferential tariff	Preferential tariff	Included
Module cleaning	Optional	Optional	Optional
Administrative Mgmt	Optional	Optional	Optional

The proposed O&M service offerings can satisfy the requirements of the various owners according to their preference for cost optimization and predictability:

- **Remote plant monitoring** 365 days/year
- **Preventive planned maintenance** to ensure long term full efficiency
- **Corrective maintenance** to promptly restore optimal working conditions and production in case of malfunctioning
- Plant **improvements and retrofits** to anticipate future problems
- **Spare parts and repair** management to minimize plant stops
- **Module cleaning** on request
- **Administrative and bureaucratic duties** vis a vis (GSE, UTF, etc...)
- Acceptance of RELAX contract is **subject to the outcome of the initial plant check-up**

O&M service offerings are available at a predetermined annual fee:

- fixed for **FLEX** (up to 100kWp)
- depending on the plant power for **SMART** and **RELAX**

TOPS Energy enjoys a **wide network of relationship with many manufacturers of key solar plant components** (i.e., inverters), giving the customer the opportunity to subscribe to **product warranty extensions** at preferential terms **

** not available for all manufacturers

TOPS Energy – Technical Support Services to Manufacturers

TOPS Energy and the Inditel Group have decades of history in successfully providing technical support services on behalf of equipment manufacturers by outsourcing, entirely or partially, their warranty and activation service processes



Service modules can be combined and aggregated to satisfy the specific requirement of any manufacturer

- Customer orientation and flexibility to adapt to different manufacturer process models, focusing on its non-core areas of activity, to become partner and unique point of reference for any warranty and product support need

- Vast expertise and experience on the various key technologies within a PV plant:

Inverters

Modules

Monitoring systems

Security systems



On-Center Service Modules

Call Center: notice receipt, dispatch and intervention completion notice

Repair Lab: product tests, retrofit, spare and components repair

Logistics: supply chain, shipment and receipts, warehousing

On-Site Service Modules

Installation check/certification and new product activation


Warranty and post-warranty repair/swap interventions

Preventive maintenance visits

On-site retrofit campaign (hardware/firmware)

TOPS Energy - The Track Record

TOPS demonstrates the highest operational excellence, and deep understanding of needs and requirements of PV plants sponsors and lenders, integrated in a flexible and independent approach to construction and O&M services

Local Presence	Resources	Background	Volumes in 2014
 <p>Branch offices in Italy</p>	<p>60 HC construction and O&M specialists + a network of over 300 specialists available on demand</p>	<p>416MW activated Inverters >100 PV plants built 2300 retrofits >50 monitoring/security systems inst.</p>	<p>5.581 Intervention requests managed</p>
			<p>4.977 on-site interventions</p>

TOPS Energy brings to you an **unrivalled set of skills, expertise and infrastructure in place** to provide the **highest quality of O&M services for large PV plants**

A specialized organization at your service with a 50 year history in maintenance (Electrical engineers, installers, technical consultants, etc)

A network or relationship with market leading manufacturers, among which:



Multi-technology and multi-brand expertise, able to integrate complex systems and solutions, to become the **unique point of reference for any maintenance need**

TOPS Energy – Una Presenza Locale diffusa in tutta Italia



With the **Service Center**, TOPS Energy can **guarantee the operation on customer sites in Italy with the most stringent SLA**

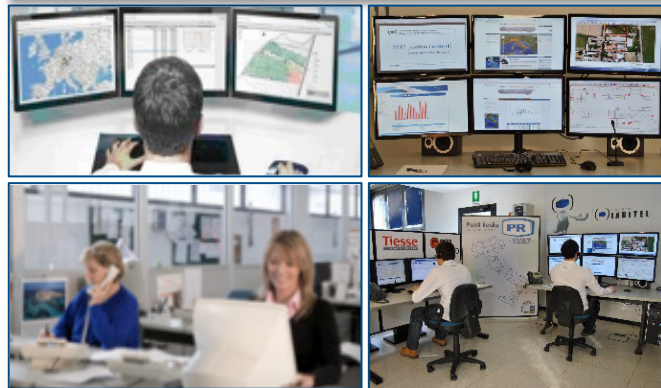
Efficient and expert organization of Service

TOPS Energy - Advanced Service Delivery Model

TOPS Energy has implemented a **state-of-the-art technical service organization**, organized around a central and a local layers, both supported by a specialized IT platform

- Key Service Organization concepts have been **derived from maintenance best practices** in the Solar PV and in other industries, such as ICT, where Third Party Maintenance has been practiced since 30 years
- Processes and organization for O&M services to PV plants have obtained **ISO 9001 certification**

Central Control Room



Advanced O&M Service Organization Model

Centralized Process Control (24/7)

- Control Room
 - PV plants monitoring
 - Remote restart and assistance
 - On-site intervention request
- Activity Planning
 - On-site Engineer activity schedule
 - Spare parts availability and ordering
 - Contract SLA Mgmt
- Central Technical Support
 - 2° and 3° level escalation (up to OEM)
 - Spare logistics and repair

Field Organization

- 15 Local Branches
- 60 Maintenance Engineers
- 300 Technical Specialists
- Local Spare Parts Warehouse

PV plants monitoring is performed with the equipment installed on the plant or market std tools

O&M IT Systems: TASFO

- O&M service Mgmt
 - Ticketing Mgmt
 - Activity Planning & Tracking
 - Spares parts and repair logistics
- Contract & Admin Mgmt

TOPS Energy - Service Mgmt IT system: TASFO®

Specialized Maintenance IT solution compliant with ISO 9001 management system

Ticketing management

TASFO automatically assigns a ticket to any warning received by the remote monitoring system, and to any required scheduled maintenance task

Activity planning

TASFO performs a priority analysis of each case, assigns it to the nearest available technical specialist and directly loads the task date in the specialist's agenda

Spare parts management

TASFO gives full control of spare parts inventory and logistics and never let the stock fall below the minimum level

Articolo Map.	Descri. Art. Mag.	Matricola	Serial Number	Deposito	Giustizia	In Arrevo	In Usato	Stato
12kw	Inverter PV1-12-S-OUT-IT	1111.00	849512118					
12kw	Inverter PV1-12-S-OUT-IT	1111.00	894804951	S.C.	1			In Riparazione (Interna)
12kw	Inverter PV1-12-S-OUT-IT	1111.00	454846412	S.C.	1			
12kw	Inverter PV1-12-S-OUT-IT	1111.00	12133848	S.C.	1			
12kw	Inverter PV1-12-S-OUT-IT	1111.00	33958505	S.C.	1			
3kw	Inverter PV1-3-S-OUT-IT	1111.00	45948541	S.C.	1			
3kw	Inverter PV1-3-S-OUT-IT	1111.00	44485121	S.C.	1			
3kw	Inverter PV1-3-S-OUT-IT	1111.00	45484816	S.C.	1			
3kw	Inverter PV1-3-S-OUT-IT	1111.00	484946	S.C.	1			
6kw	Inverter PV1-3-S-OUT-IT	1111.00	45456440456	S.C.	1			
6kw	Inverter PV1-6000-OUT-IT	2111.00	8745					In Spedizione (Guasta)
6kw	Inverter PV1-6000-OUT-IT	2111.00	84512021	S.C.	1			
6kw	Inverter PV1-6000-OUT-IT	2111.00	5845612130	S.C.	1			
6kw	Inverter PV1-6000-OUT-IT	2111.00	65456440464	S.C.	1			
6kw	Inverter PV1-6000-OUT-IT	2111.00	684841202	S.C.	1			
AURORAMOD	Modulo Inverter 55 kW	1224.00	487345	S.C.	1			In Magazzino
AURORAMOD	Modulo Inverter 55 kW	5672.00	684787	S.C.	1			In Magazzino
STRINGCOMB	Quadro di campo	4321.00	5487954	S.C.	1			In Magazzino
STRINGCOMB	Quadro di campo	8784.00	1229462	S.C.	1			In Magazzino

Activity tracking & SLA mgmt

TASFO tracks all the steps and times of the maintenance task, allocates back office resources and/or spare parts if required, keeps the Customer up to date on the task status by sending emails All in real time

TOPS Energy - Knowledge, Operational Excellence, Independence and Flexibility

UNDERSTANDING OF CUSTOMER NEEDS

Consolidated Experience

- Knowledge of market best practice data and track records and benchmarking references available from the large portfolio of operational PV plants under management
- Access to advanced technical analysis from inverters manufacturers and from the PV Plant network, including field testing of innovative tools and components designed to improve overall PV plant performances
- Analysis and implementation experience of systems and services for PV plant security and performance monitoring

Relationship Network

- On-going relationship with the leading lenders to the PV sectors and understanding of their requirements versus the O&M contract and contractor
- On-going relationship with leading insurers to support to negotiation of revised insurance premiums following the adoption of improved security or minimized business disruption solutions

OPERATIONAL EXCELLENCE

Central Control Room

- Dedicated centre located near Milan and operating on a 365 days; 7/7, 24h
- 5 skilled resources in PV monitoring using various market tools and capability to design and implement state-of-the-art monitoring systems
- Specialized and dedicated IT platform for O&M process management

Extensive Local Presence

- **15 local centres** across Italy and availability of **60 HC O&M trained** workforce with prompt intervention capabilities (**416 MW of PV plants activated, 4.977 requests handled and 5.581 on-site interventions performed in 2014**)
- Centrally coordinated management of spare parts stock with sophisticated internal repair lab and 15 local warehouses

Relationship with Leading Technology Manufacturers:

- 3 Technical support staff and on-going relationship (technical escalation, training, spare parts) with the prominent technology manufacturers
- **Certified warranty service for major PV inverter manufacturers**
- **ISO 9001 certified processes and organisation**

STABLE RETURNS

FLEXIBLE APPROACH

Pure Service Approach

- Scope of the services and guaranteed performances are adapted to the specific requirements of each client
- Tailor-made service, with the ability to develop innovative new service components or tools, such as "SWAT Team" of resources and spares components in stock to promptly address the restoration of full performance of a PV plant following a disruptive intrusion

INDEPENDENCE

Independence from EPC Contractor

- As opposed to when the EPC contractor itself is performing the O&M activities, TOPS will always act in the best interest of the plan owner.

Alignment of Interest

- Willingness to share with the owner risks and rewards from the performance of the entrusted PV plants

Your Strategic Partner for O&M and Support Services

TOPS Energy is uniquely positioned to provide independent and specialized O&M services to utility scale PV plants and can help customers significantly improving the level of performances and returns from their PV plants



TOPS Energy is available to analyse the specific requirements of your PV plants and prepare a customized quote and migration plan

- ✓ Experienced and knowledgeable
- ✓ Independent from EPC contractors and manufacturers
- ✓ Specialized: O&M is our unique business
- ✓ Advanced organization and infrastructure in place
- ✓ Certified provider of technical assistance and activation services for major manufacturers of PV inverters
- ✓ Local presence to ensure proximity with any PV plant and capabilities to consistently support any spread PV plant portfolio
- ✓ Efficient and cost effective
- ✓ Flexible and tailored offering, with full alignment of interests with the PV plant owners
- ✓ Superior quality and dedication to full customer satisfaction
- ✓ Commercial and Technical partner of Meteo-Control and DRAKER for the design, installation and maintenance of remote monitoring solutions for PV plants



commerciale@topsenergy.com

T +39 02 5099 0091

Head Office

Viale Rimembranze, 20

20068 Peschiera Borromeo (MI)

www.topsenergy.com

TOPS Energy is part of Gruppo Inditel

