onesait

DER Integration

DER Management for Multiple Stakeholders

minsait

An Indra company

Distributed Energy Resources

The energy sector is entering a new era of decentralization, reshaping how electricity is generated, distributed, and consumed. This shift is driven by the urgency to meet global sustainability goals and rising commodity prices.

Technological advances, combined with reduced taxes and incentives for Distributed Energy Resources (DERs), are promoting the adoption of renewable energy that is increasingly decentralized and closer to the point of consumption. However, renewables like solar and wind are intermittent and unpredictable, creating challenges for grid management. IRENA estimates significant investments of 720 USD billion/year required globally from 2024 to 2030 to modernize the grid and support this transition[1]. To address this, enhanced demand-side flexibility and DERs are essential to balance the variability of renewable energy and minimize costly grid reinforcements. Meanwhile, digitalization is also transforming the energy landscape, enabling new opportunities for demand-side flexibility. In this context, the role of aggregators is becoming increasingly important, allowing aggregated portfolios of distributed resources to participate in energy markets and provide valuable services to the system.

This will help stabilize prices, enhance supply security, and generate savings for consumers, all while reducing the need for extensive grid investments and supporting the shift to a decarbonized energy system.

As part of the effort to modernize the grid and integrate more renewable energy sources in Europe, regulatory bodies such as the EU DSO Entity and ENTSO-E have proposed the Network Code on Demand Response. This code aims to standardize the participation of demand response resources in electricity markets and grid operations, ensuring that all available resources can contribute to grid stability and efficiency. By defining clear guidelines for the aggregation, dispatch, and compensation of demand response resources, the Network Code supports a more flexible and resilient energy system. It also promotes fair market access for DERs, enabling them to provide essential services like voltage support and frequency regulation. Regulatory support for these approaches, like the FERC Order No. 2222 in the U.S. and EU initiatives, is essential for advancing DER management solutions. Effective integration enables DER aggregators to provide awareness of behind-the-meter DERs and support grid services, enhancing system global efficiency.

1. IRENA Report - TRACKING COP28 OUTCOMES (2024)

New Challenges for the Grid...

Decentralization of the Energy System:

The energy transition is making the grid more decentralized, requiring utilities to rethink traditional management strategies.

Variability of Renewable Generation

The unpredictability of wind and solar energy complicates grid balancing, demanding advanced forecasting and management tools.

Complex Energy Flows

Mesh grids with bidirectional energy flows challenge monitoring and control, requiring new grid control tools.

Grid Congestion and Demand Management:

Increased demand from new technologies can lead to congestion, making effective demand management and strategic upgrades essential.

Protection Equipment Issues:

Traditional protection systems may struggle with unexpected bidirectional flows, requiring updates for safety and reliability.

Expanding Grid Capacity

Electric vehicle adoption and other electrified solutions demands significant grid capacity upgrades, which must avoid overbuilding.

...New Opportunities for the rest of the Electricity Value Chain

System Operation

- ✓ New Markets for Grid Services
- ✓ Lowering Prices in Existing Energy Markets
- ✓ TSO/DSO Coordination enhancement

Customer Management

- ✓ New Energy Services
- ✓ New Roles
- ✓ New Revenue Streams providing Services to the System

Asset Management

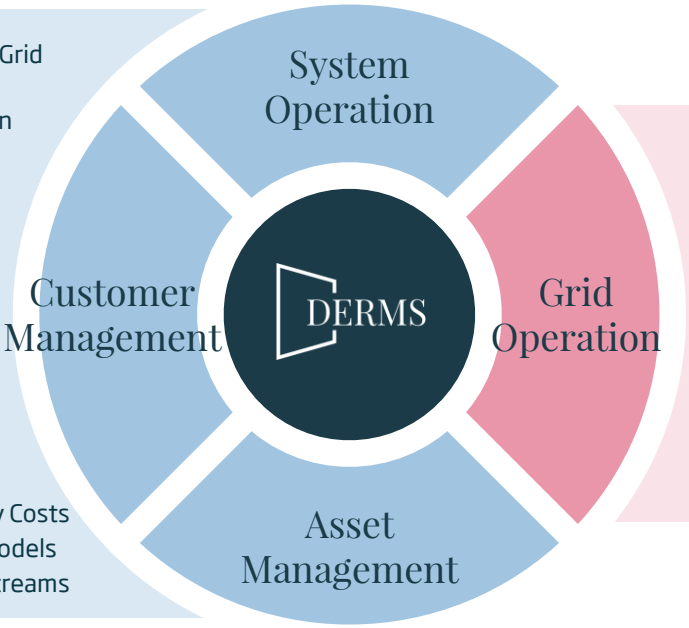
- ✓ Ease Permitting through Non-Firm Capacity
- ✓ Reducing Energy Costs by Demand Shifting
- ✓ New Business Models Around New Energy assets
- ✓ New Revenue Streams providing Services to the System

Distributed Energy Resources Management Systems

Distributed Energy Resources Management Systems (DERMS) should provide solution to all these challenges and opportunities, managing the integration of DERs into distribution grids, while providing tangible benefits for their owners. DERMS shall support a wide range of resources, including renewable and non-renewable distributed generation, energy storage systems, electric vehicle charging infrastructures, and different controllable loads, as well as resource aggregation for broader system and customer benefit.

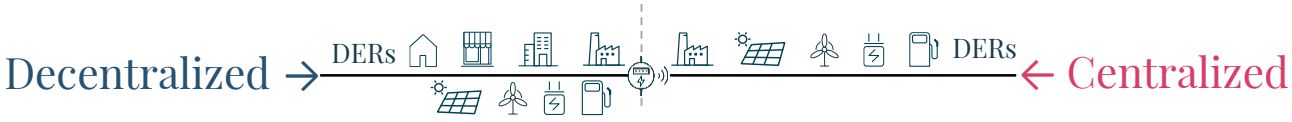
Opportunities

- ✓ New Markets for Grid Services
- ✓ Lowering Prices in Existing Energy Markets
- ✓ New Energy Services
- ✓ New Roles
- ✓ New Revenue Streams
- ✓ Ease Permitting
- ✓ Reducing Energy Costs
- ✓ New Business Models
- ✓ New Revenue Streams



Challenges

- ➢ Decentralization of the Energy System
- ➢ Variability of Renewable Generation
- ➢ Complex Energy Flows
- ➢ Grid Congestion and Demand Management
- ➢ Protection Equipment Issues
- ➢ Expanding Grid Capacity



Current Approach of DER management solutions is fragmented. Utility DERMS primarily focus on managing large-scale, grid-connected resources, while aggregator DERMS aims to handle smaller, customer-side resources. Even though the goals and targets differ from one perspective to another, from a Solution developer point of view, this function isolation creates inefficiencies and limits the potential for holistic DER management. Purely centralized or decentralized developments face limitations and function overlapping, such as flexibility registration and management.

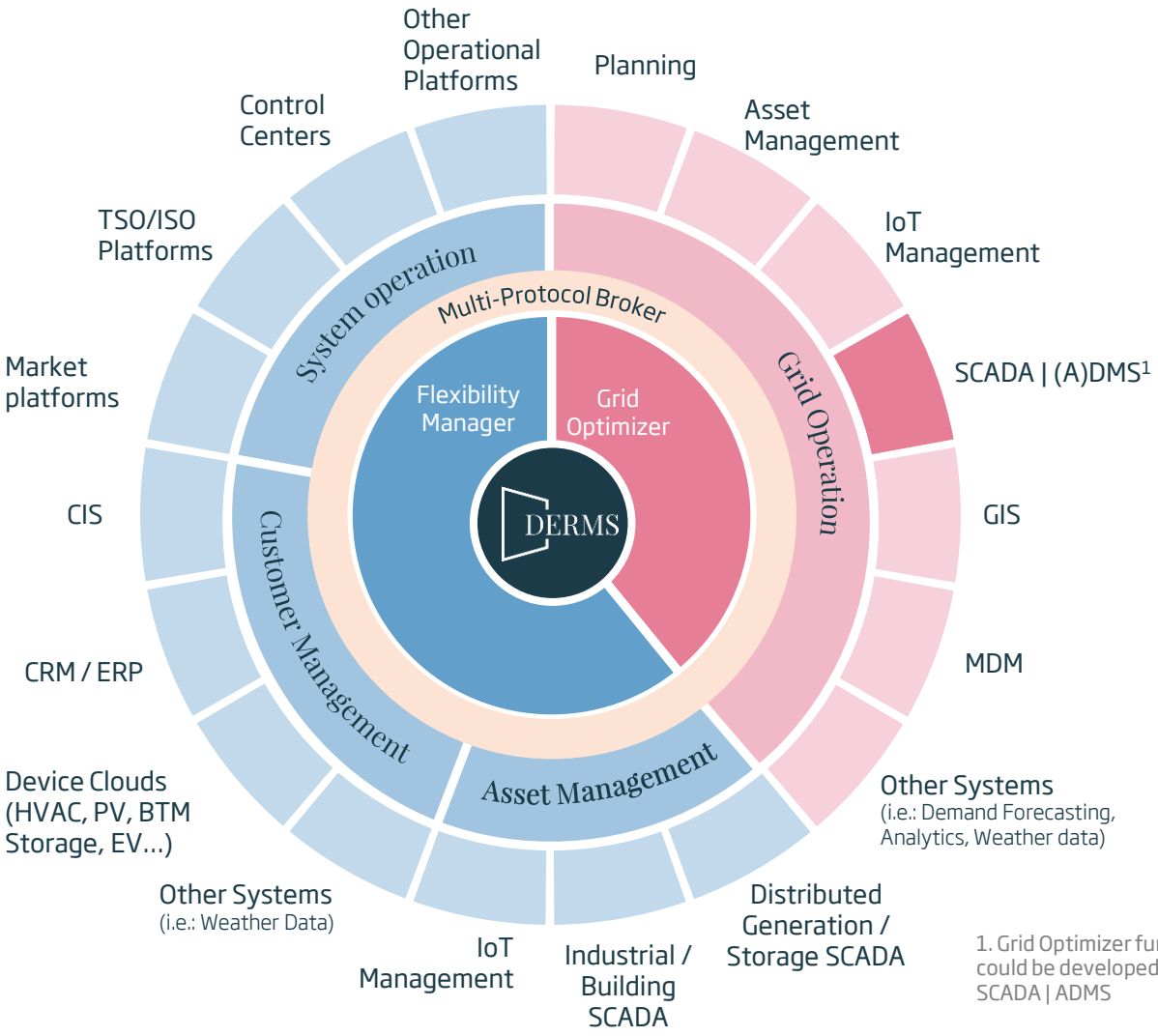
A unified DERMS architecture...

...addresses these limitations by combining the strengths of both centralized and decentralized models, bringing to each of its functions the understanding of the need of all involved stakeholders, and assuring a future seamlessly integration for bundled or unbundled regulations. It offers a modular and adaptable framework that can be tailored to meet the needs of various stakeholders, including utilities, aggregators, Energy Services Companies device niche verticals and microgrid operators. This approach ensures seamless integration and coordination across different levels of the energy system, facilitating optimized energy management and improved grid resilience.

A modular structure that adapts to every need

DERMS

Our Comprehensive DERMS architecture, both modular and versatile, is adaptable to the particularities of all of our client typologies and their use cases.



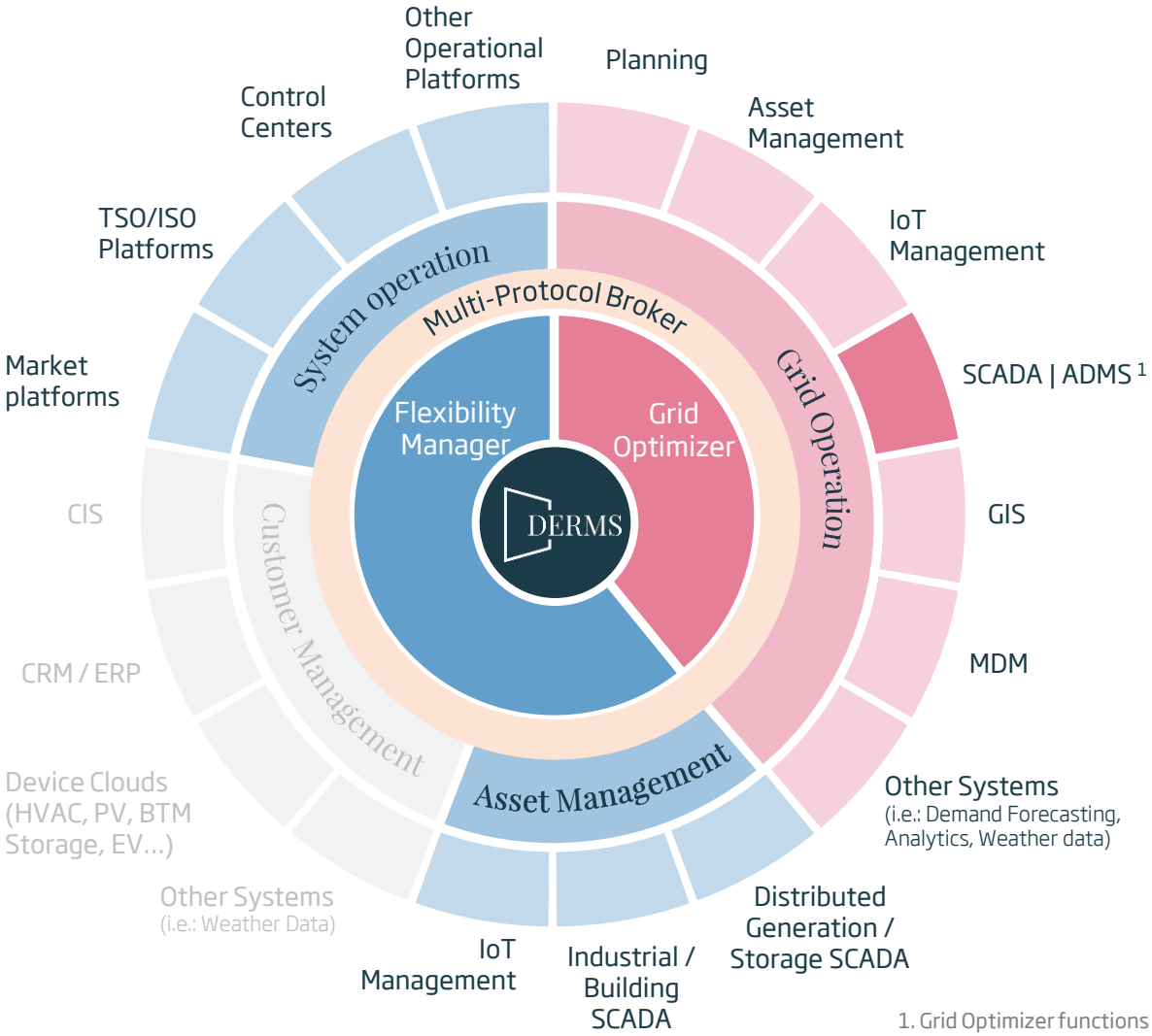
1. Grid Optimizer functions could be developed within SCADA | ADMS

	✓ **Flexibility Manager**	Flexibility Registration, Market Integration, Product Characterization, Aggregation and Service Orchestration
	✓ **Grid Optimizer**	Grid Criticalities anticipation and solution proposal including Closed-Loop-Control Real-Time DER Control
	✓ **Multi-Protocol Broker**	Multiple Tele-control, Industrial and IoT data acquisition and transformation Broker

Onesait DERMS solution is capable of meeting requirements of very diverse clients using the same set of software products, combined in different ways according to the specific use case. Using our Proprietary products Onesait Flexibility (Flexibility Manager), Onesait Grid Ipa or Onesait SCADA (Grid Optimizer), and Onesait Grid Babel (Multi-Protocol Broker), we are able to deliver different versions of our DERMS for:

DERMS For DSOs

DSOs are in charge of managing the local and regional medium voltage (MV) and low voltage (LV) distribution grids. Their responsibilities include grid planning, real-time monitoring and control of grid condition. Adding DERMS capabilities, will help them to coordinate local assets through bilateral contracts or market based mechanisms, and optimize them for grid services at the distribution level. For doing so, they would need to forecast load and generation to anticipate potential criticalities, schedule and dispatch resources, determine compensation caps for DER owners and aggregators, and collaborate with TSOs to meet wider grid requirements. Functions related to performance analysis and aggregation–like local optimization, demand response, and energy community activities– are not typically part of the standard DERMS solution for unbundled DSOs, as these are specific to aggregators or Integrated Utilities.



1. Grid Optimizer functions could be developed within SCADA | ADMS

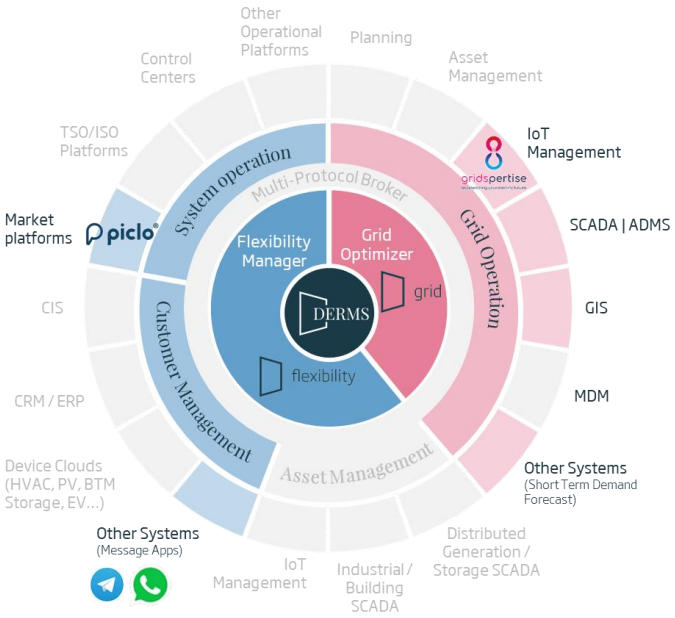
Use Cases | Time Horizon

Years / Months	Days / Hours / Minutes	Seconds / Milliseconds
✓ Hosting / Non Firm capacity ✓ Flexibility Qualification & Contracting	✓ DER Situational Awareness ✓ Congestion Management ✓ Power Quality Optimization	✓ DER Monitoring & Direct Control

enel adopts Onesait DERMS to complement its ADMS suite and source flexibility through new local markets and bilateral contracts

Context

Growth of distributed generation, and demand and transport electrification means new challenges for grid operation, including dealing with reverse power flows, lines congestion and voltage regulation issues. In 2021, a new regulation in Italy (DCO-322/2019) enforces the preparation and adoption of flexibility solutions by grid operators, to reduce the needs for grid reinforcement and its associated investment, and to promote the exploitation of demand flexibility. Enel selects Onesait DERMS Solution due to its Microservices-based architecture, which make it globally suitable to fill the gap in their current systems map with minor overlapping with ADMS critical operation functions.



Key Outcomes

- ✓ DERMS function can be managed outside of the ADMS ecosystem (but not in seconds / milliseconds with closed-loop-control)
- ✓ A Microservices-based architecture is key to guarantee the separation of functions and scalability
- ✓ It is necessary to adopt a DERMS solution before regulation comes in, due to DERMS long Time-to-Market deployments (1,5 – 2 Years approx..)
- ✓ Short Term Demand Forecast quality establishes the limit for Short Term Congestion anticipation
- ✓ Although DSOs have all technology in-place, Demand needs more incentives to run the needed investments to enable their participation since price signals for the last auctions have not been enough attractive (average of 1 contracts / auction / region)

Main Capabilities

- ✓ Integration with local flexibility market for contracting flexibility from FSPs connected to MV to be activated in Short Term Operation of Congestion Management (Italy)
- ✓ Bilateral Contracts with FSPs connected to HV to be activated in Real Time Operation of Congestion Management (Colombia)
- ✓ Short Term Optimal Power Flows (OPFs) for congestion anticipation (Italy) and for Checking status of on-going Congestions (Colombia)
- ✓ Optimal allocation of flexibility considering market rules (activation/recovery times, ramp up/down...) (Italy)
- ✓ Short Term FSP activations through Message Apps (Italy)
- ✓ Short Term FSP Reconnections through IoT Management

Years / Months

- ✓ Flexibility Qualification & Contracting

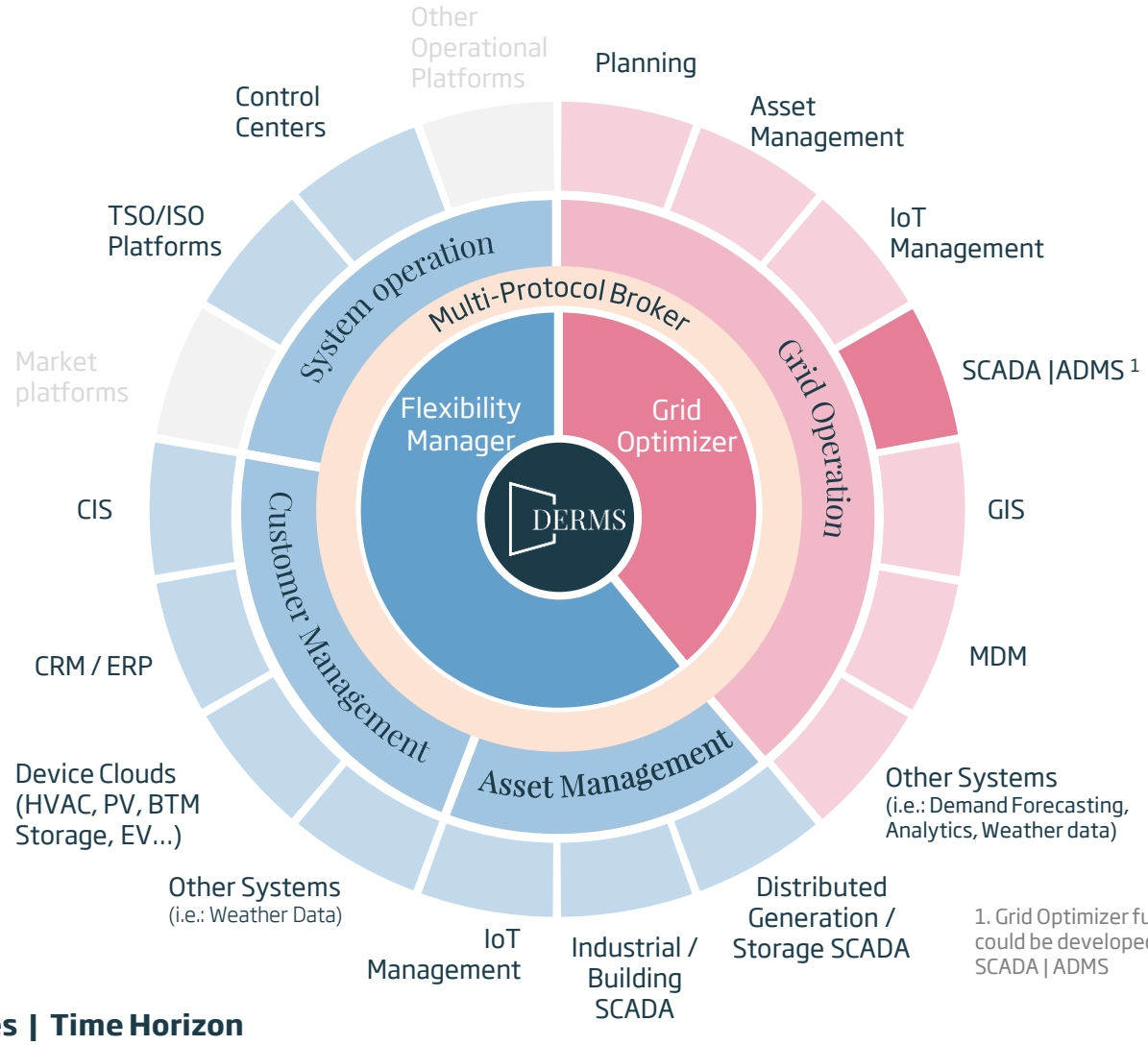
Days / Hours / Minutes

- ✓ Congestion Management

Seconds / Milliseconds

DERMS For Integrated Utilities

Vertically Integrated Utilities, additionally to their responsibilities as DSOs and Retailers, will incorporate DER Aggregation features mainly to run Demand Response Programs that will help them to minimize the purchasing costs of energy at peak hours. DERMS functionalities for integrated Utilities would include the capability of setting-up bilateral contracts with a set of representative customers (most likely beyond 1MW) to directly control their manageable assets through IoT Management or SCADA integrations. Additionally, DERMS would allow them to run Demand Response Programs with third-party aggregators, such as specialized platforms for batteries or electric vehicles. Finally, Integrated utilities could leverage DERMS to provide their customers with Local Optimization or Energy Efficiency Services over their energy assets, within the same platform., as new services to be incorporated to their retail portfolio, managed under the current commercial process tools (CRM, CIS, ERP...).



1. Grid Optimizer functions could be developed within SCADA | ADMS

Use Cases | Time Horizon

Years / Months

- ✓ Hosting / Non Firm capacity
- ✓ Flexibility Qualification & Contracting
- ✓ Time of Use (TOU) Tariffs

Days / Hours / Minutes

- ✓ DER Situational Awareness
- ✓ Congestion Management
- ✓ DER Monitoring & Indirect Control
- ✓ Power Quality Optimization
- ✓ Local Optimization
- ✓ Citizen Energy Communities

Seconds / Milliseconds

- ✓ DER Monitoring & Direct Control

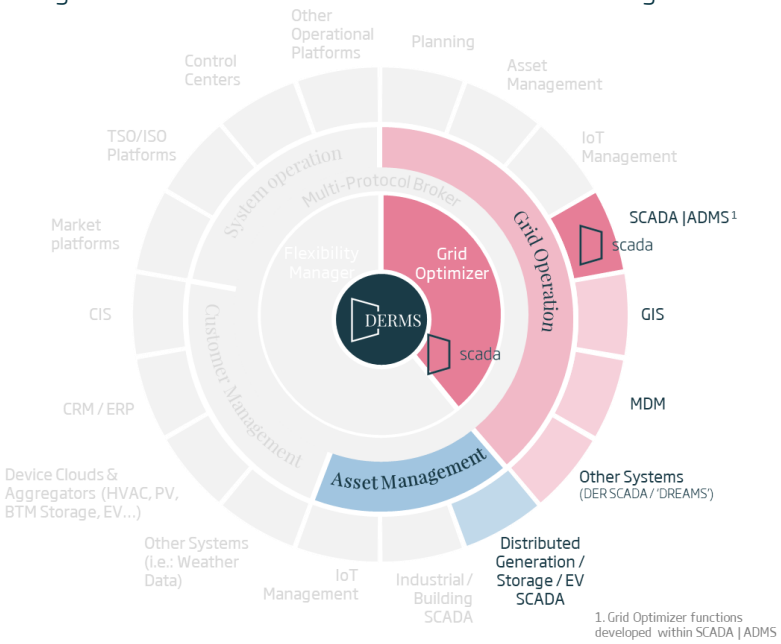




integrates Onesait SCADA | ADMS and TPCs DER SCADA (DREAMS) to manage direct control DERs from 3 regional Control Centers

Context

Minsait is delivering a comprehensive set of direct control DERMS functionalities for TPC, leveraging this Utility's currently available DER SCADA solution (DREAMS) across its three regions and multiple control centers per region. As the single electric utility in Taiwan, responsible for generating, transmitting, distributing and supplying electricity to millions of residential, commercial, and industrial customers, this ambitious project seeks to fully renew and modernize its Distribution Control Centers, including the implementation of the new SCADA/ADMS system and its integration with the recently deployed DERMS solution to handle an increasing amount of renewable distributed generation and demand assets in the distribution grid.



Key Outcomes

- ✓ As ensuring continuous operation is paramount, hence the system is being deployed with High Availability and Mission Critical Redundancy in a Real-time Environment.
- ✓ Full integration with centralized DER SCADA (DREAMS) involves a number of challenges for project implementation and ongoing communication with directly controlled assets (through DER SCADA)
- ✓ Integration carried out through standard energy market communications protocols (ICCP)
- ✓ Cybersecurity is a transversal work stream that imposes strict requirements

Main Capabilities

- ✓ Long term Hosting Capacity provided though study functions, leveraging ADMS standard features such as Study Mode and Power Flow Analytics

- ✓ DER Load forecasting (including both generation & consumption) as main input for grid criticalities triggering
- ✓ Optimal Power Flows (OPFs) for management of criticalities and Volt Var Control (iVVc) for Power Quality
- ✓ Local DER Optimization

- ✓ Real Time DER monitor and control (Solar, Wind, Storage, EVs)

Years / Months

- ✓ Hosting Capacity

Days / Hours / Minutes

- ✓ DER Situational Awareness
- ✓ Congestion Management
- ✓ Local Optimization
- ✓ Power Quality Optimization

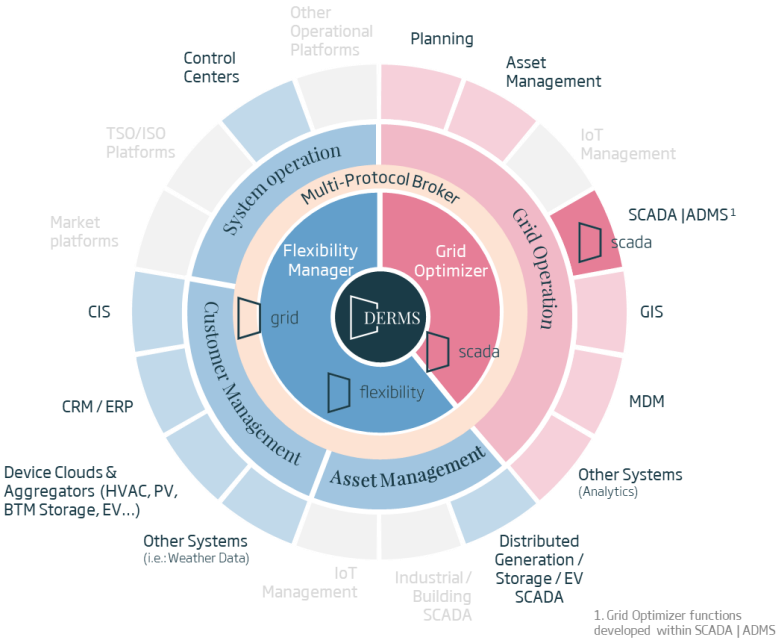
Seconds / Milliseconds

- ✓ DER Monitoring & Direct Control (Solar, Wind, Storage, EVs)

الشركة السعودية للكهرباء Saudi Electricity Company leverages Onesait DERMS together with Onesait SCADA | ADMS to run DER management from 4 regional Control Centers

Context

Minsait is set to deliver a comprehensive DERMS solution for Saudi Electricity Company, enhancing its distribution operations across two regions and four control centers, besides a National Distribution Monitoring Center (NDMC). As the one of the largest electric utility in the Middle East, responsible for generating, transmitting, distributing and supplying electricity to millions of residential, commercial, and industrial customers, this ambitious project seeks to fully renew and modernize its Distribution Control Centers, including the SCADA/ADMS system and a newly deployed DERMS solution to handle an increasing amount of renewable distributed generation and demand assets.



1. Grid Optimizer functions developed within SCADA | ADMS

Key Challenges

- ✓ As ensuring continuous operation is critical, the system will be deployed with High Availability, prioritizing migration planning, deployment, and IT redundancy.
- ✓ Fully on-premise deployment encompasses a number of difficulties for project implementation and ongoing communication with indirectly controlled assets
- ✓ Change management processes for a wide and diverse operation crew, as well as integrating legacy systems and tools appears as a key factor for success
- ✓ Cybersecurity is a transversal work stream that imposes strict requirements

Main Capabilities

- ✓ Integration with CRM/ERP/CIS to collect data about Contracts with FSPs to be used in the Short Term or Real Time Use Cases
- ✓ Long & Short Term Flexibility contracts with DER owners and Aggregators
- ✓ Aggregator Platform Integrations for indirect DER Portfolio awareness

Years / Months

- ✓ Hosting Capacity
- ✓ Flexibility Qualification & Contracting

- ✓ DER Load forecasting (including both generation & consumption) as main input for grid criticalities triggering
- ✓ Optimal Power Flows (OPFs) for detection of criticalities and Volt Var Control (iVVc) for Power Quality
- ✓ Multi-protocol communication with Aggregator systems for Short Term activation and reconnection
- ✓ Local DER Optimization

Days / Hours / Minutes

- ✓ DER Situational Awareness
- ✓ Congestion Management
- ✓ Local Optimization
- ✓ Power Quality Optimization
- ✓ DER Monitoring & Indirect Control

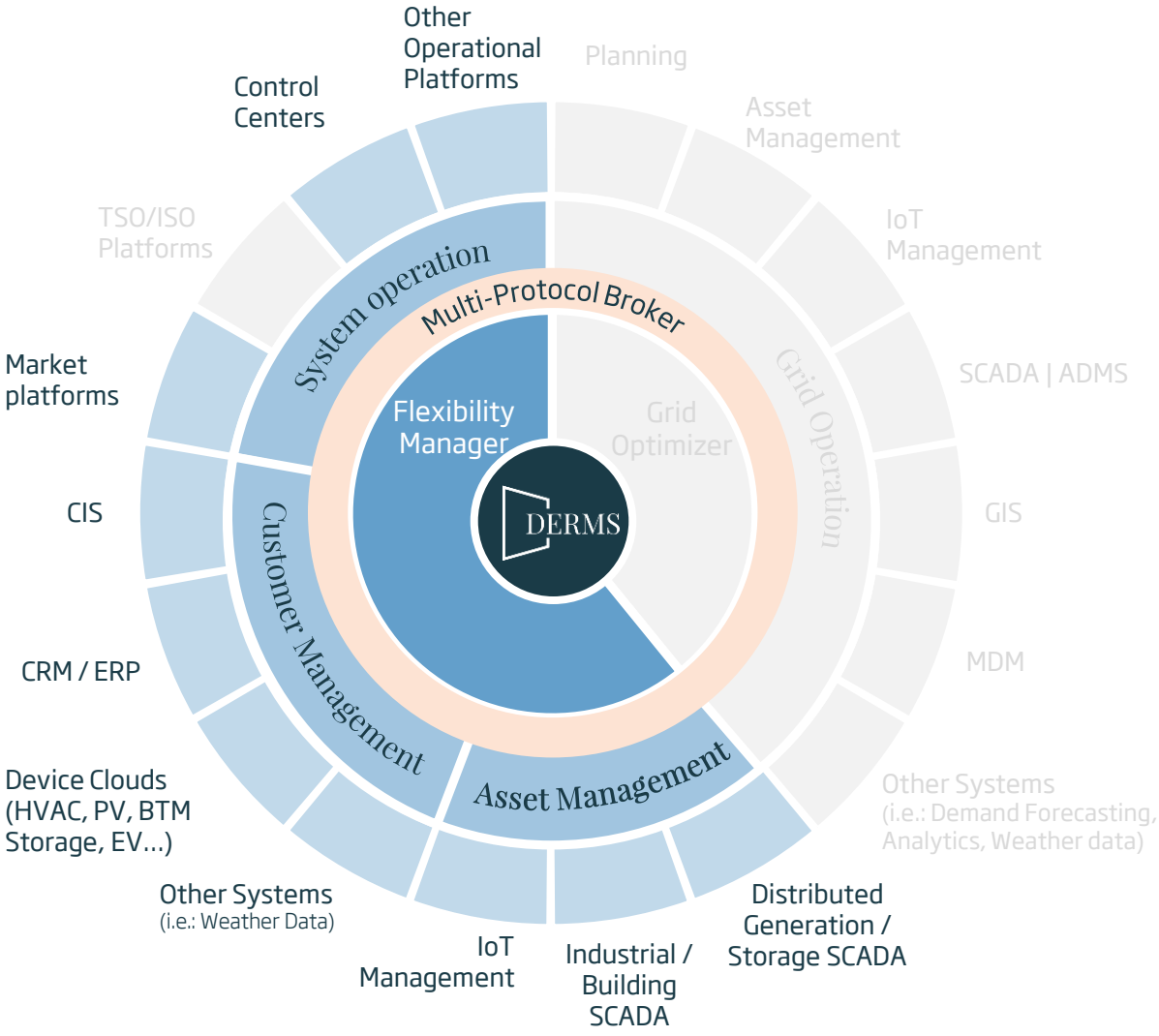
- ✓ Real Time DER monitor and control (Solar, Wind, Storage, EVs)

Seconds / Milliseconds

- ✓ DER Monitoring & Direct Control (Solar, Wind, Storage, EVs)

DERMS For Retailers & Aggregators

DER aggregators and retailers bring together different customer types of demand (mainly Residential and C&I), including behind-the-meter (BTM) Energy assets, into larger manageable groups to offer flexible capacity in different markets. Aggregator and Retailer DERMS does not include any core grid-related functions, as these fall outside their responsibilities. When it comes to these peripheral aspects of DERMS, aggregators do not interact directly with Grid Operators but rather through market platforms, control centers or other operational platforms. On the other hand, retailers and aggregators leverages in a set of Customer and Asset Management tools to provide a variety of new energy services around their clients flexible energy assets, both from local perspective (under a cost saving drivers), and system participation perspective (to achieve new revenues).



Use Cases | Time Horizon

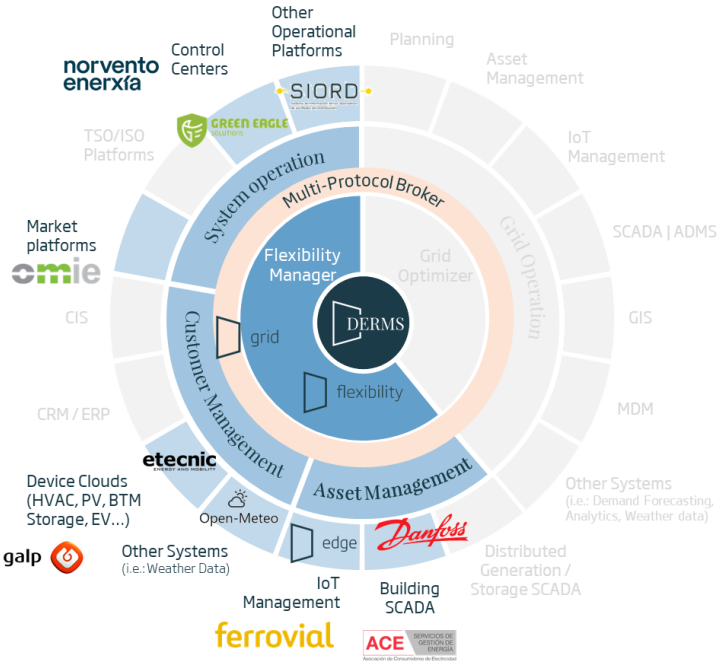
Years / Months	Days / Hours / Minutes	Seconds / Milliseconds
✓ DER Portfolio Management	✓ Local Optimization	
✓ Flexibility Qualification & Contracting	✓ Citizen Energy Communities	
✓ Portfolio Performance Analysis	✓ VPP Programming & Dispatch	
✓ Time of Use (TOU) Tariffs	✓ Demand Response	

become Independent Aggregators within Onesait DERMS to run a net MW Virtual Power Plant in Markets

Context

The FlexAbility project aims to finalize the development of explicit demand aggregation in Spain, focusing on the role of the Independent Aggregator in Energy and Local Flexibility Markets. It will analyze and design a viable model to be implemented in demonstrators, ultimately proposing regulation for the Independent Aggregator. Demonstrators will include real sites and mirror environments managing flexibility portfolios from Galp's EV charging points, HVAC systems in supermarkets from ACE's client portfolio, and buildings with behind-the-meter storage from Ferrovial's portfolio.

FLEXABILITY



Key Challenges

- ✓ Integration of all diverse systems and technologies under a single platform
- ✓ Engaging market participants
- ✓ VPP potential vs real flexibility deviations management
- ✓ Selection of the right BSP – BRP compensation model
- ✓ Coincidence of VPP assets with DSO flexibility requirements areas
- ✓ Flexibility activation price determination

Main Capabilities

- ✓ DER & equipment characterization
- ✓ Integration of monitoring power meters, solar, battery , EV charging stations and HVAC equipment under a single platform
- ✓ Flexibility activation contracting
- ✓ Generation, demand and storage assets forecast for flexibility calculation
- ✓ Devices control through Edge & Cloud-to-cloud integrations
- ✓ Short Term activations in Local Flexibility Markets
- ✓ Price arbitrage and VPP position optimization in Day/Intraday Markets
- ✓ Coordination with Control Centers and SIORD

Years / Months

- ✓ Flexibility Qualification & Contracting

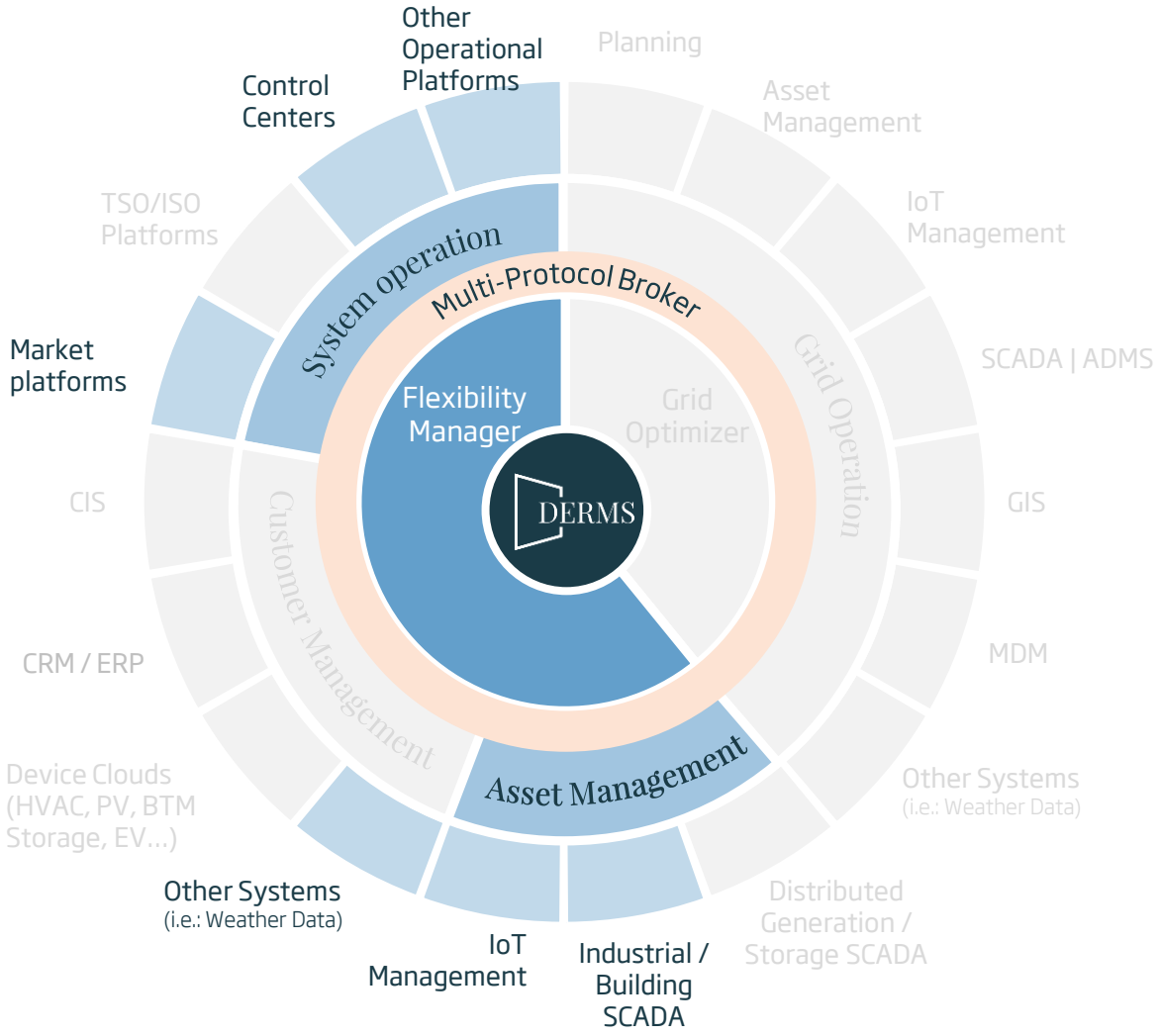
Days / Hours / Minutes

- ✓ VPP Programming & Dispatch

Seconds / Milliseconds

DERMS For ESCOs

Energy Service Companies (ESCOs) need a DERMS with advanced flexibility management capabilities to meet the evolving needs of clients and remain competitive. As more clients aim for carbon neutrality and seek cost savings, ESCOs must offer innovative services to optimize energy use, integrate renewables, and manage demand-side activities. DERMS will enable ESCOs to model all demand, generation and storage equipment in a single solution, manage tariffs, and monitor and control energy assets for overall supply optimization. As demand becomes an active player, ESCOs need to implement smarter, more complex operation strategies, including forecasting and locally optimizing, but also sharing energy through collective self-consumption schemes or participating in energy markets and grid services. The intricate ecosystem of assets and stakeholders requires technological support for integration of edge devices, SCADA systems, third-party cloud platforms, markets and operational data platforms, likely through control centers, to ensure efficient coordination and compliance.



Use Cases | Time Horizon

Years / Months

- ✓ DER Portfolio Management
- ✓ Flexibility Qualification & Contracting
- ✓ Portfolio Performance Analysis
- ✓ Time of Use (TOU) Tariffs

Days / Hours / Minutes

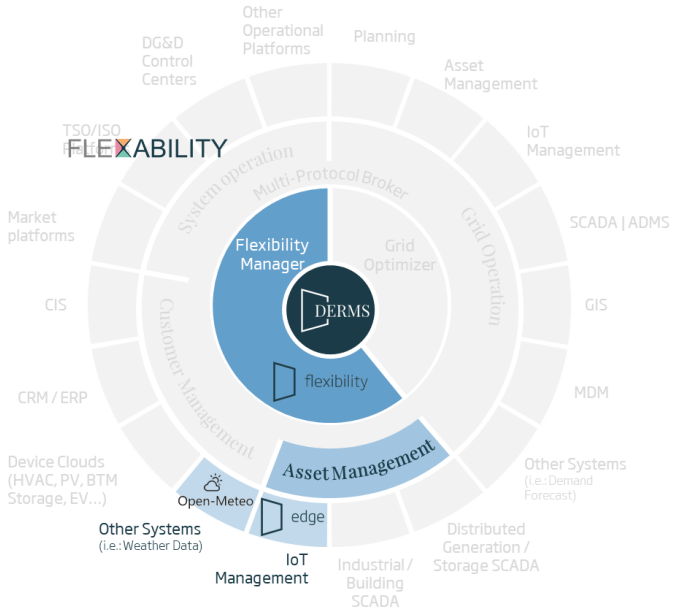
- ✓ Local Optimization
- ✓ Citizen Energy Communities
- ✓ VPP Programming & Dispatch

Seconds / Milliseconds

ferrovial orchestrates generation, consumption and storage to maximize energy savings, as the first step to jump into Flexibility Services

Context

In a context of ever-increasing competitiveness in the provision of new energy services, Ferrovial is exploring new ways to maximize savings for their clients and create differential value propositions by taking advantage of new distributed energy resources, such as on site photovoltaic generation, batteries and electric vehicles. Ferrovial and Minsait have partnered to assess the viability of integrating local storage optimization and demand management processes into their routine operations, as a basis to develop a common roadmap of new energy services. Next steps will include Energy Communities Piloting and participation in Spanish Flexibility Sandboxes.



Key Outcomes

- ✓ There is value in the process since it helps understanding demand usage, providing a powerful tool for Operation Managers, who are able to manage more buildings within the same time
- ✓ Leveraging existing monitoring equipment is key to make the business case
- ✓ Technology and AI are not plug-and-play and require adaptations to the specific site conditions
- ✓ Local flexibility services might reduce overall payback while preparing for the provision of services to the grid and the participation in markets
- ✓ Understanding cost drivers and analyzing the complete business case as an Energy Services Provider

Main Capabilities

- ✓ DER & equipment characterization
- ✓ Integration of monitoring power meters, solar, battery and HVAC equipment under a single platform
- ✓ Client Tariff Management

- ✓ Generation & demand forecast and flexibility calculation
- ✓ Economic optimization model, based in historical demand, weather, occupation and tariff to calculate optimal scheduling for battery
- ✓ Economic optimization model taking into account demand flexibility from HVAC to calculate optimal setpoint scheduling

Years / Months

- ✓ DER Portfolio Management
- ✓ Time of Use (TOU) Tariffs

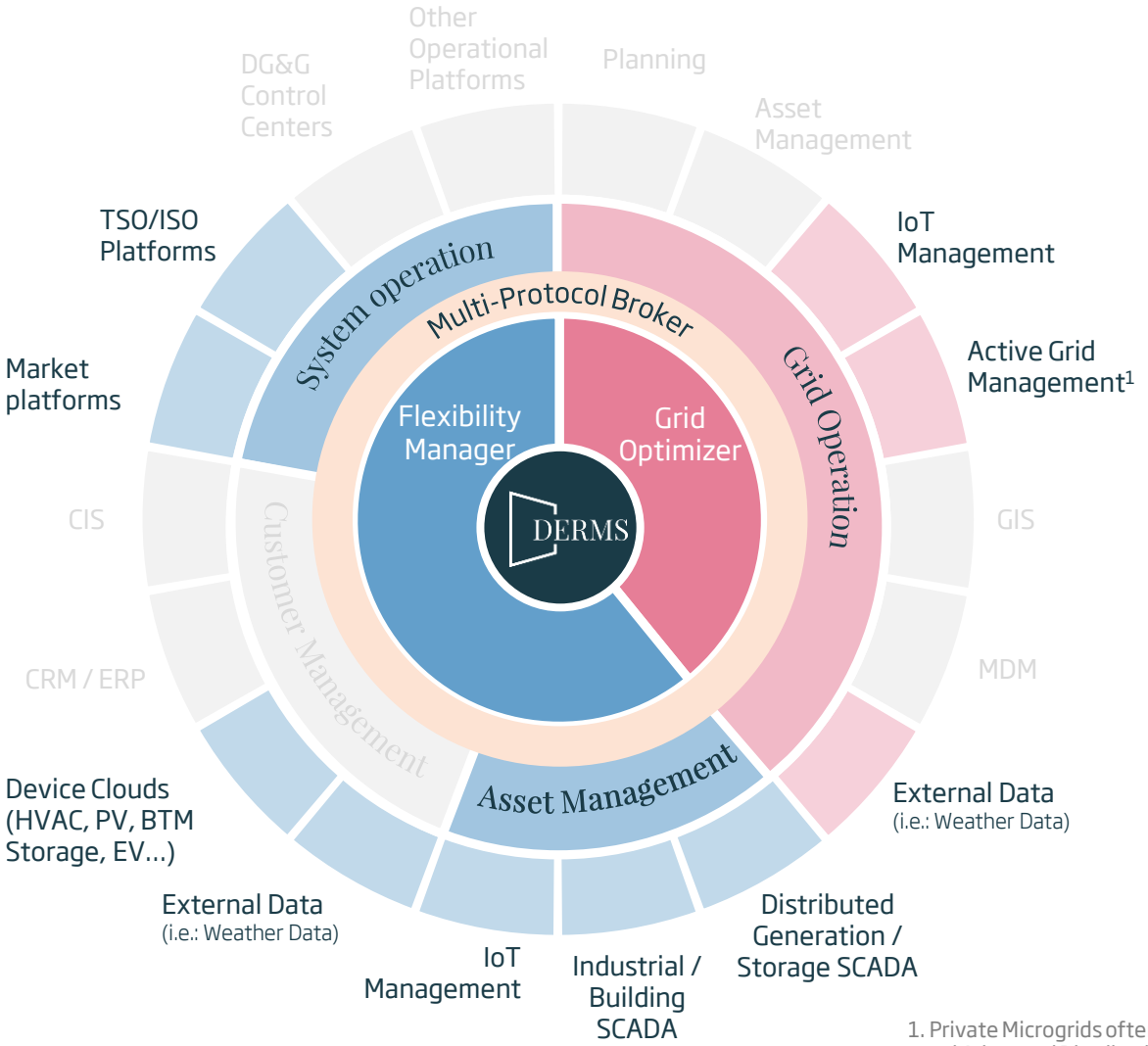
Days / Hours / Minutes

- ✓ Local Optimization

Seconds / Milliseconds

DERMS For Private Microgrids

Microgrids need to be able to function in two modes: grid-connected, where they optimize local resources and provide services to the main grid, and islanded, where they handle grid-forming operations, balance loads, and regulate frequency and voltage to maintain stable and reliable operation. As a result, this type of DERMS must include core grid basic operation capabilities required for island mode operation such as Active Grid Management. Of the main electrical parameters (P, Q, M, S), together with the features used by aggregators related to local energy resources, such as, IoT Management, Device Clouds and Building / Generation SCADAS integrations (the latter just if Microgrid incorporates utility scale Distributed Generation deployments). When operating in grid connected mode, they would need to be integrated to DSO/TSO/ISO Platforms, and to their Market Platforms to be able to provide System services.



1. Private Microgrids often does not need Advanced Distribution Management System (P, Q, M, S)

Use Cases | Time Horizon

Years / Months

- ✓ DER Management
- ✓ Flexibility Qualification & Contracting
- ✓ Portfolio Performance Analysis

Days / Hours / Minutes

- ✓ Congestion Management
- ✓ Peak Shaving
- ✓ Local Optimization
- ✓ Grid Services

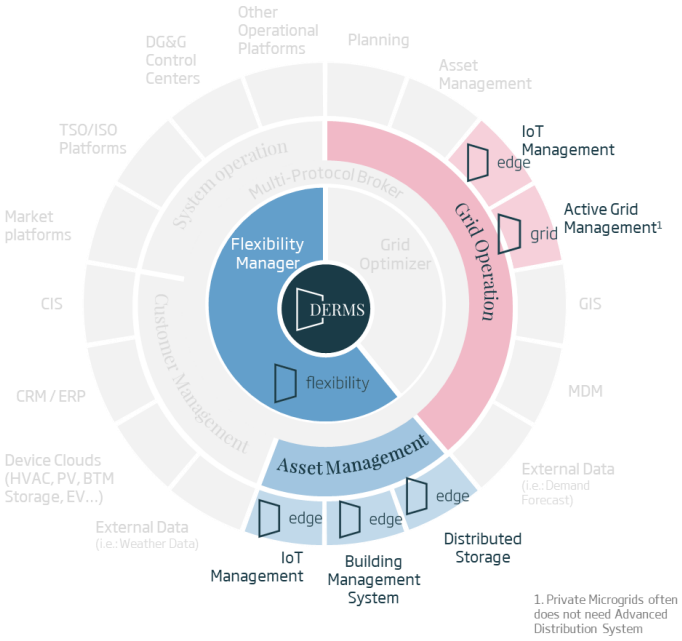
Seconds / Milliseconds

- ✓ Active Grid management
- ✓ Congestion Management
- ✓ Distribution AGC
- ✓ Grid Services

MONASH University deploys Onesait DERMS in their embedded network at Clayton Campus to contribute to University Net Zero Initiative

Context

In 2017, Monash University started a Transformation Project to convert its Clayton Campus in Melbourne (Australia) into a Net Zero Precinct. The implementation of a sustainable microgrid, along with energy efficiency solutions and Distributed Energy Resources (DERs), would facilitate the exploration and demonstration opportunities for grid modernization through the use of affordable and available technology. Monash selected Indra to address grid control and operation, coordination of DERs (such as PV generation and Storage), and Building Automation Systems (BAS), with the aim of running peak shaving events and, eventually, provision of services to the public distribution grid at the connection point.



Key Outcomes

- ✓ Testbed with real operation conditions to set an industry benchmark in Australia and establishing a de-facto Energy Competence Center for the region
- ✓ Understand value proposition for both network and behind-the-meter assets and customers, contributing to final regulation and supporting other Demand Response Programs and VPP pilots by ARENA and AEMO
- ✓ A distributed architecture is key to enable local control in real time
- ✓ Available Inertia of grid-connected Microgrids may favor DER economic dispatch instead of a more technical operation
- ✓ A close collaboration of all agents (developers, managers, manufacturers, utilities...) is required in this type of project and solutions are not plug-and-play

Main Capabilities

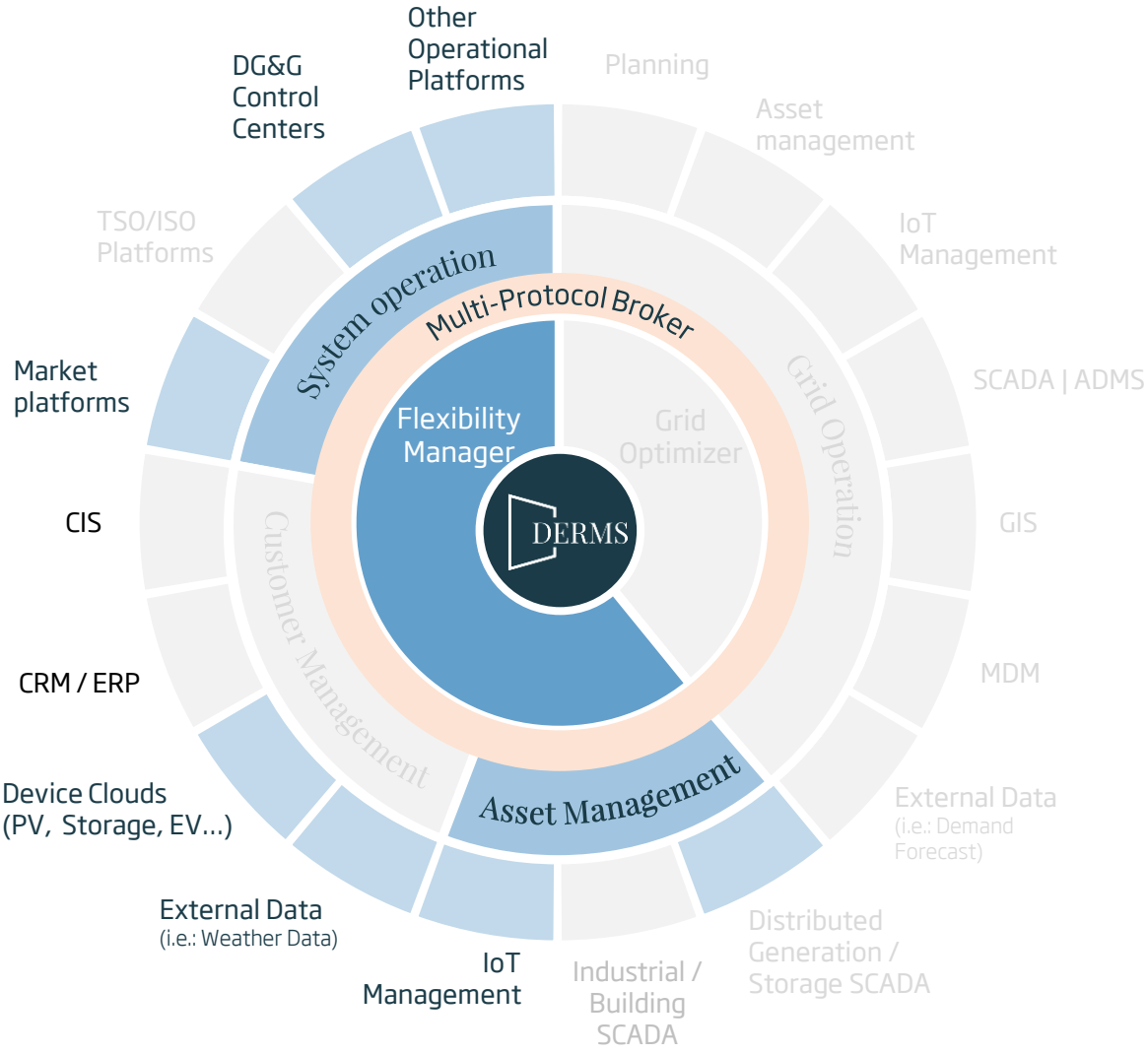
- ✓ Day-ahead and short term Demand Response economically optimal schedules must be validated by a grid-aware Power Quality Management System (PQMS)
- ✓ An Operating Training Simulator (OTS) component is a key element of the Power Quality Management solution

- ✓ Full deployment of Minsait edge distributed architecture and Active Grid Management solutions proved key to enable local control in real time
- ✓ The Real Time Unified Dataspace (in this case provided by Minsait proprietary iSpeed) as a communication broker enables connectivity between systems and coordination

Years / Months	Days / Hours / Minutes	Seconds / Milliseconds
	✓ Peak Shaving ✓ Grid Services	✓ Active Grid management ✓ Grid Services

DERMS For EV Service Providers

Mobility Service Providers (MSPs) operate electric recharge infrastructure for their customers to enjoy a hassle-free charging experience. With ever-increasing electric demand connected to distribution networks, acquiring new connections and operating them becomes more complex and costly. In order to continue growing their business, MSPs must rely in DERMS to proactively manage demand, onsite generation and storage. DERMS will enable a more efficient operation, staying within limits of flexible connection agreements, calculating optimal battery operation schedules or participating in flexibility services for grid operators, through bilateral contracting or local markets. Advanced connectivity functionality within DERMS will be required to integrate with the underlying EV operating platform and internal CRM systems, to price and transfer economic incentives to customers.. Similarly, connecting to market platforms and control centers becomes critical to enable the participation in these new services.



Use Cases | Time Horizon

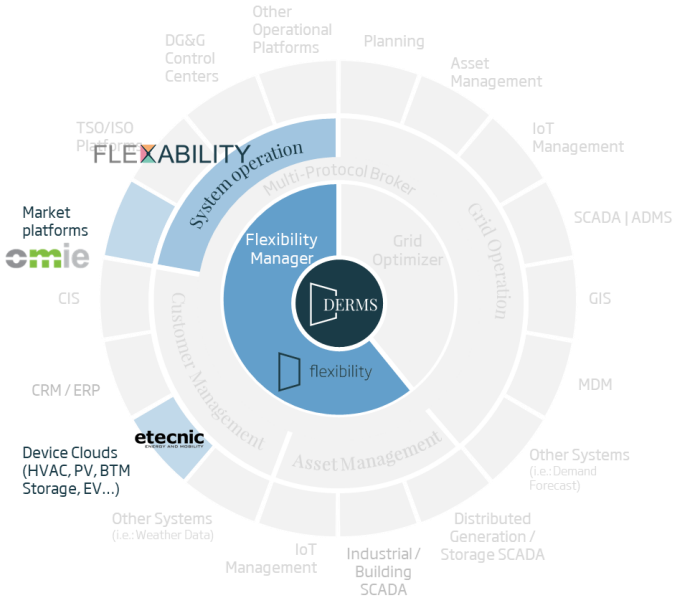
Years / Months	Days / Hours / Minutes	Seconds / Milliseconds
✓ Flexibility Qualification & Contracting ✓ Portfolio Performance Analysis ✓ Time of Use (TOU) tariffs	✓ Smart Charging ✓ Local Optimization ✓ Citizen Energy Communities ✓ VPP Programming & Dispatch	✓ Flexible connection compliance (peak shaving)

galp integrates its electric mobility platform into Onesait DERMS for participation in omie Flexibility and Energy Markets

Context

moves Movilidad Eficiente & Sostenible Proyectos Singulares

With electric mobility ever increasing its penetration rate into most markets, Electric Mobility Service Providers (e-MSP) need new ways to differentiate their value proposition and improve the profitability of their business. Galp, Minsait, Etecnic and the market Operator OMIE participate in a demonstration project in Spain, testing an innovative new business model whereby Galp aggregates the demand flexibility from a number of EV recharge stations and participates in the Local Market. Next steps will include Energy Communities Piloting and participation in Spanish Flexibility Sandboxes.



Key Findings

- ✓ Testing and demonstration of new business models is necessary, with cooperation from all parties, so the new model can be actually regulated and developed
- ✓ Cloud-to-cloud integration of vertical niche platforms such as Etecnic's provides maximum value as it opens the new aggregation service to the whole recharge infrastructure portfolio and vice versa
- ✓ Electric mobility business has the driver at the core and thus any service interruption has to be minimized or otherwise rewarded
- ✓ Local operation of assets (storage) provides robustness and ensures safe operation but, in turn, provokes a disconnect from the whole flexibility management portfolio that may be economically inefficient

Main Capabilities

- ✓ EV charging points + BHM battery characterization for flexibility calculation
- ✓ Flexibility availability & activation contracting
- ✓ Cloud-to-cloud integration with CPO platform to collect EV charging station demand

- ✓ Demand forecast and flexibility calculation
- ✓ Integration with OMIE Local Flexibility Markets for reception of DSO requirements and optimal bidding
- ✓ EV charging point + battery control for demand response activation through service interruption or power reduction

- ✓ Local disaggregation of power limitation among available chargers
- ✓ Local operation of battery to ensure compliance with flexible connection agreement

Years / Months

- ✓ Flexibility Qualification & Contracting

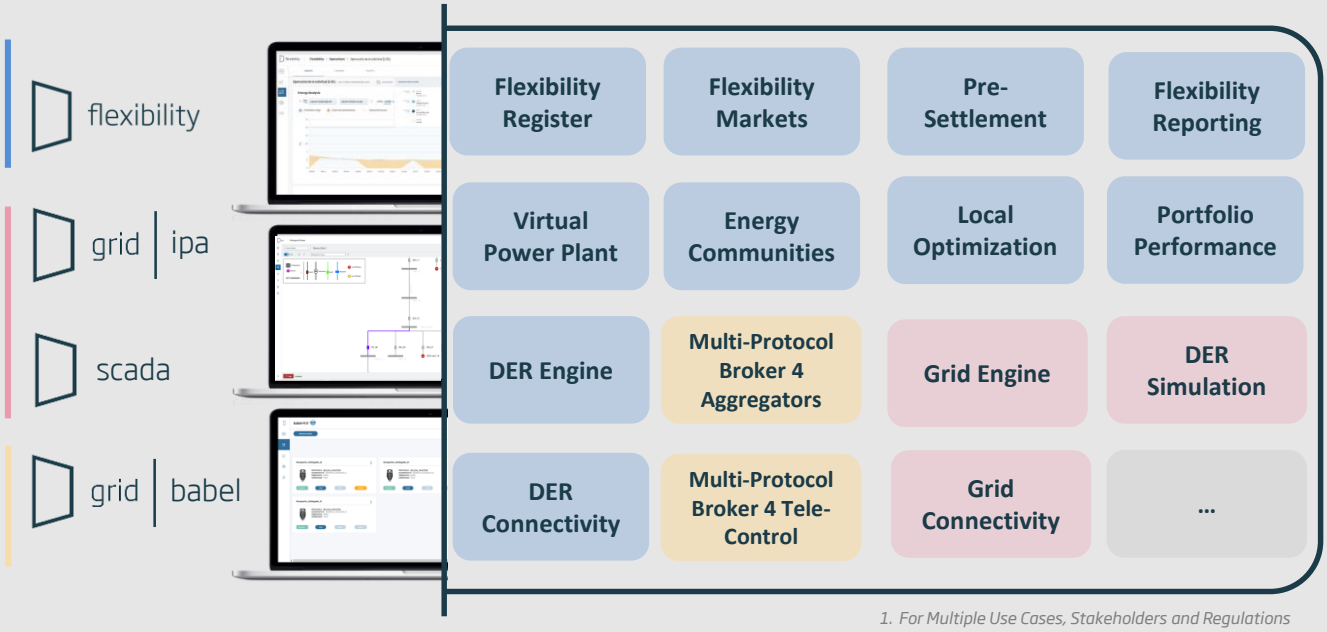
Days / Hours / Minutes

- ✓ VPP Programming & Dispatch

Seconds / Milliseconds

- ✓ Flexible connection compliance (peak shaving)

A Microservices based DERMS Comprehensive[1] Platform...



1. For Multiple Use Cases, Stakeholders and Regulations

IDC Gartner

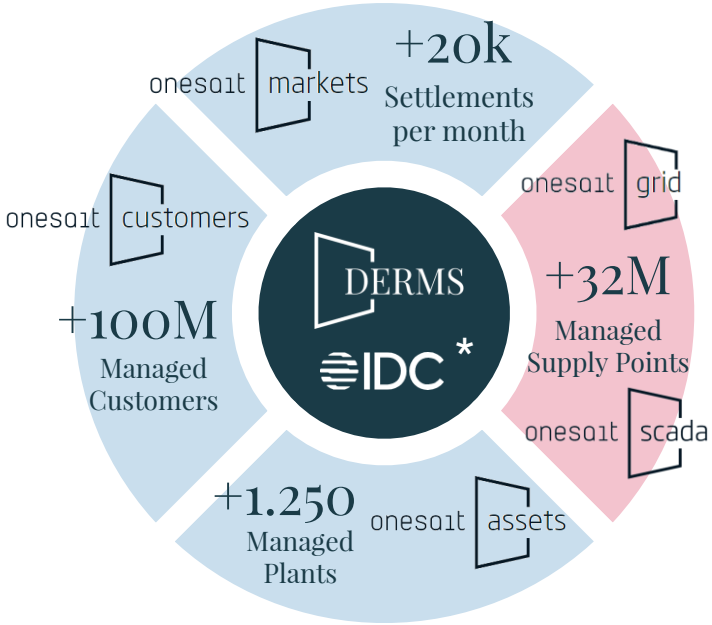
...as a result of our deep and recognized sectorial Knowledge

onesait

+40
Years of Experience

+140
Countries

+375
Clients



* Recognized as **Leader** in the IDC MarketScape Worldwide **Distributed Energy Resource Management Systems Service Providers** Vendor Assessment

About Us

About Minsait

Minsait (www.minsait.com), an Indra company, is a leading firm in digital transformation and Information Technologies. Minsait has a high degree of specialization and knowledge of the industry, which endorses its high capacity to integrate the core world with the digital world, its leadership in innovation and digital transformation, and its flexibility. Thus, it focuses its offering on high-impact value propositions, based on end-to-end solutions, with a notable degree of segmentation, which enables it to achieve tangible impacts for its clients in each industry with a transformational approach. Its capabilities and leadership are demonstrated in its range of products, under the Onesait brand, and in its range of transversal services.

About Indra

Indra (www.indracompany.com) is a leading global technology and consulting company, and a technology partner to its clients' core business operations around the world. It is a world leader in the provision of proprietary solutions in specific segments of the Transportation and Defense markets, and a leading firm in Digital Transformation and Information Technology Consulting in Spain and Latin America through its subsidiary Minsait. Its business model is based on a wide range of proprietary products, with a high-value end-to-end approach and an important innovative component. In the 2020 financial year, Indra achieved a turnover of 3,043 million euros and had nearly 48,000 employees, a local presence in 46 countries and commercial operations in more than 140 countries.

onesait utilities flexibility

onesait utilities grid

onesait utilities scada

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