

## Case Study

# Secure Integrated Distributed Energy Resource Register

## PROBLEM STATEMENT

The operation of the power grid is done in real-time 24 hours a day, 365 days a year to ensure stability and integrity of power in Australia. In Australia, residences and businesses are installing rooftop solar and batteries ('**Distributed Energy Resource**') in mass numbers meaning the collection of these small scale solar, batteries and other forms of DER are creating large benefits for all Australians by reducing the overall cost in energy generation.

These distributed energy resources are feeding electricity in the power grid making the power grid more dependent than ever with no comprehensive register that records the DER systems installed in homes and businesses across Australia.

The energy market will be utilising the DER register to gain an understanding of DER systems connected to the electricity network to plan for and operate the National Electricity Market with a high DER penetration.

The co-ordination of these resources is vital in measuring energy consumption to optimise their financial benefit and allow the power grid to efficiently manage the bi-directional power flow.

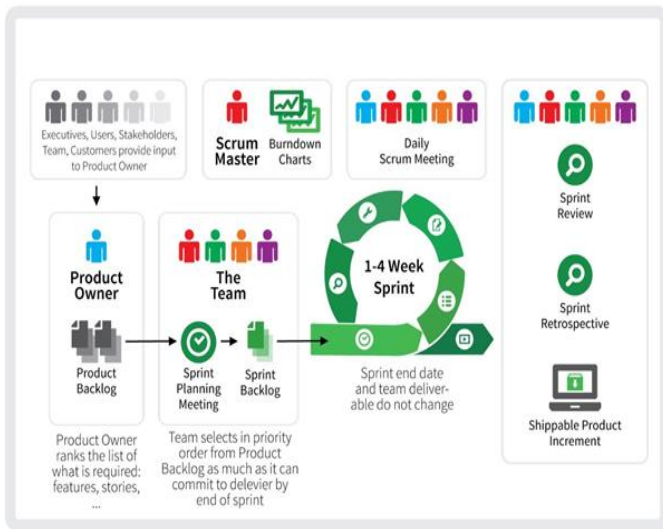
## SOLUTION

Adactin has worked in the energy sector to create a centralised register that will record data in relation to small generating systems such as solar and battery storage systems up to 30 megawatts with standardised data sets, and business rules to capture this critical information about distributed energy resources in Australia

## SNAPSHOT

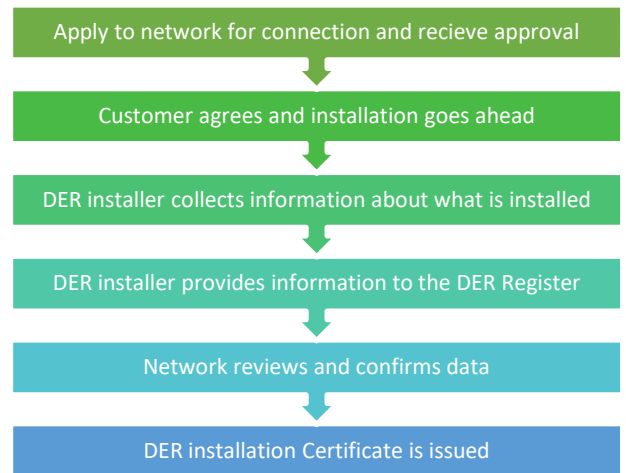
**Industry:** Energy Sector  
**Business Unit:** Digital Transformation  
**Services:** Custom Application Development (APIs and Web Portal)

- Team Size: 10  
(5 x Java Developers, 3 x Testers, 1 x Technical Writer, 1 x Scrum Master)
- High-velocity agile methodology with one-week sprints for continuous development
- Structured weekly releases using continuous integration and continuous deployment (CI/CD)
- Agreement on requirements and priorities with business and energy industry along with identification of GAPS in requirements and technical documentation
- Use of best practice processes to ensure iterative, incremental and evolutionary improvements, efficient face-to-face communication, very short feedback loop and adaption cycles, and quality focused.
- Worked with key stakeholder such as infrastructure team, cloud team, security team, release management by taking ownership of the problem and working to connect all the pieces together to bring the complete solution.
- Focus on quality by tracking and managing defects with the goal to bring it down to zero and also creating automated testing to identify issues quickly for resolution.
- Verification through requirements traceability matrix
- Daily scrum meetings to management product backlog and priorities, identify and resolve issues, provide commitment and delivery of weekly sprint.



9. The system will also enable mobile access already used to support data provision. The systems have been developed and designed to minimise the effort from DER installers and electrical contractors.
10. Ensure high-security standards are met and penetration testing is conducted by third parties & issues remediated to maintain the high-security standards in the energy sector

## DER Workflow Process



## WHAT WAS DEVELOPED

- Secure web portal for both network service providers (NSPs) and DER installers
- Application Protocol Interface (API) for NSPs to integrate into their systems
- Centralised Database

*In addition to the above the solution included:*

1. Industry alignment on the minimum data set and extended data sets
2. Industry alignment with agreed business
3. Development of business to business (B2B) integration with Network Service Providers (NSPs) through APIs and a web portal allowing them to integrate the centralised register to their individual processes.
4. An API that will link to an NSP's system to the DER register system.
5. Development of business to consumer (B2C) integration through a web portal for solar.
6. Enabling application developers to develop systems that support NSPs and third parties to provide data to the DER register's systems.
7. Work on automation to streamline the workflow between network service providers and solar installers.
8. Working with NSPs and Installers to carry out testing on the DER Register.

## Uses of the DER Register



1. **Network Service Providers (NSP)** – use the DER register to capture and retrieve up-to-date DER records and provider approval for DER installations and plan, operate and invest in network infrastructure where required.
2. **DER Installers** – provide information about DER equipment installed such as manufacture, model, serial number, protection, and control settings etc
3. **Data Sources** – data received from other sources such as the National Meter Identifier (NMI) used for DER systems.
4. **Planning & Forecasting** – data used by the market operator to plan and forecast energy requirements now and into the future
5. **Public Reports** – data used to provide reports to the government and the Australian public about energy in Australia to allow policymakers to make more informed decisions. This can also be used by the Australian public to form a public view of energy in Australia
6. **Government** – data is used by the government to ensure the DER installation integrity of the system
7. **Emergency Services** – uses the data to respond adequately and potentially use battery during disasters.

## Technology Stack

- Node JS + APIs
- AWS
- Microsoft Azure
- Azure Active Directory
- Google Apigee
- Microsoft SQL Server
- Talend
- SQL Data Warehouse
- GitLab
- Elastic Search
- Splunk Cloud

## Benefits

- Help forecast, plan and operate the grid more efficiently, ensuring the system and market delivery energy at an efficient price to all Australian
- Be prepared for major disruptions and how DER assets will behave during these event
- Prepare the grid for major innovation with DER such as virtual powerplants, and enabling customers to consider and participate in new markets with DER
- Allow energy networks to make better-informed decisions about investment opportunities in the future as demand changes and DER increases.
- Agree with stakeholders in the energy sector on data sets and collection processes into the register.
- Automation of data feeds and access to information through a secure API mechanism
- Real-time input of information of DER assets from solar installers or network service providers
- Provides visibility of electricity generated in, and exported from, households and businesses, which will enhance power system reliability for Australia.

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Adactin is a premium Australian software consulting company dedicated to excellent software development and testing with a comprehensive service suite encompassing quality assurance, design and development services, data analytics products and other digital transformation enterprise solutions including quality ICT training programs. The company has a core competency and thought leadership position built around the science of IT development and testing application development. For more information, please visit <https://www.adactin.com>

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