

## **NEXT GENERATION NETWORKS**

Engaging communities in a smart energy future

**Sean Sullivan**  
**Network Services Manager – South Wales**



## Outline

- Western Power Distribution – Who we are
- WPD's Innovation Strategy
- Innovation Projects with Communities

# Western Power Distribution – Who we are

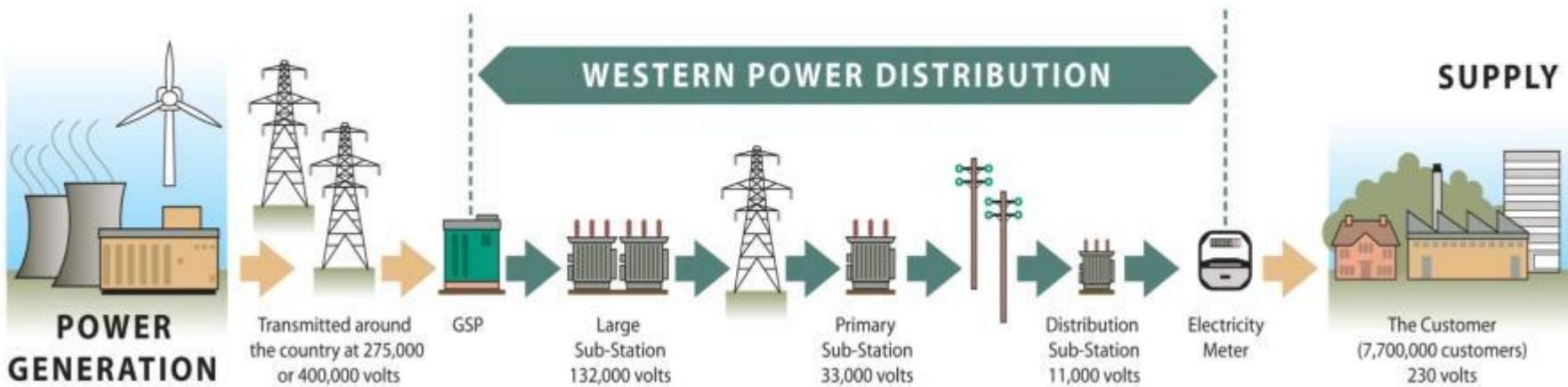
WPD is a Distribution Network Operator (DNO)

We distribute electricity to 7.8 million customers

We operate 4 of 14 distribution licence areas in the UK



# Western Power Distribution – Who we are



## Key Activities

- Maintain the network
- Connect new customers
- Fix the network

## Providing a value for money service

- **Customers pay for everything we do so they have a right to expect excellent performance and value for money.**
- **The average domestic customer in GB pays around £100 a year for distribution – around 27p a day. This figure is 43% lower in real terms since privatisation**
- **What do customers get for this money? Across UK networks as a whole:**
  - **Power cuts have halved over the past 15 years**
  - **Satisfaction levels are close to 90% across the board**
  - **£100bn has been invested since privatisation in 1990, with another £45bn planned up to 2023**
  - **Costs to customers are down 17% since 1990**
  - **Fantastic innovation is being delivered, with smart networks already saving about £1bn for customers since 2015**

## Providing a value for money service

- Government has ambitions to reduce carbon emissions by 50% by 2025. This is leading to unprecedented changes in the way we use, generate and distribute energy
- The electricity distribution industry is facing the biggest change for many years as it moves from a passive to an active, smart system.
- WPD is transitioning from a Distribution *Network* Operator to a Distribution *System* Operator
  - We are seeing significant increase in distributed, renewable forms of generation connecting directly to the distribution system, including solar, wind, heat pumps and energy storage
  - More than a quarter of all electricity generation is now connected to the distribution network
  - This represents more than 30GW including almost 10GW in WPD's area
  - By 2020, we could have 1 million electric vehicles on our roads, with each needing the equivalent of an average household's electricity use



## Future Networks Programme

### Assets

- Telemetry
- Decision support
- Improved assets
- New assets
- Flexibility
- Automation
- Incident response

### Customers

- New connections
- Upgrades
- Information
- Self Serve
- Products/Service
- Tariffs
- Communities

### Operations

- Reliability
- Forecasting
- DSO
- DSR
- GBSO Interface
- Efficiency
- SHE and Security

## Network and Customer Data

- Airborne Inspections
- AIRSTART<sup>1</sup>
- Telecoms Analysis
- Superconducting Cable
- SF6 Alternatives
- MVDC Test Lab
- Smart Energy Laboratory
- Statistical Ratings
- Primary Network Power Quality Analysis

- FREEDOM - Hybrid Heat Demo
- Hydrogen Heat & Fleet
- Carbon Tracing
- HV Voltage Control
- Solar Storage
- LV Connect and Manage
- Sunshine Tariff
- Electric Nation (*formerly CarConnect*)
- Industrial & Commercial Storage
- Smart Systems and Heat<sup>2</sup>

- DSO/SO Shared Services
- Project SYNC
- Project ENTIRE
- Smart Meter data for Network Operations
- Distribution Operability Framework
- Times Series Data Quality
- Voltage Reduction Analysis
- LV Connectivity
- Losses Investigation

## What does this mean for community groups?

- Networks are already making huge progress to delivering smart networks for the future. For example:
  - WPD have published a costed DSO transition plan, updated every six months. It sets out how we will invest £125m – at no additional cost to customers – up to 2023
  - We will blend active energy management with targeted infrastructure upgrades to provide an electricity network with sufficient capacity that balances demand and generation locally
- For local energy stakeholders this may mean:
  - A smarter system using new technology – may impact when customers charge their electric cars, heat their homes, generate and store energy locally etc.
  - Better value for money – avoid costly network reinforcement by using the existing grid more flexibly
  - New income streams – take part in new flexibility markets to help networks deal with peak periods on the network (e.g. reduce demand; or turn up energy generation; or discharge power you have stored)

## What does this mean for community groups?

- **Distribution Network Operators have a large and varied range of innovation projects**
- **At WPD we've proved that we can turn a trial into a business-as-usual activity within a year with our Flexible Power initiative, encouraging half-hourly metered businesses to reduce their electrical consumption or increase their on-site generation. In this way we can manage network constraint, avoiding costly reinforcement as the standard response**
- **This is a model that could be used to develop new, local energy market platforms for the future.**

# INNOVATION PROJECTS WITH COMMUNITIES

## OPEN LV

**Software Platform installed at 80 LV substations.**

**To provide community energy groups access to LV data and trigger new ideas!**

**And give the opportunity to develop apps that can run on the platform.**

# INNOVATION PROJECTS WITH COMMUNITIES

## OPEN LV

- Community energy groups and businesses had the chance to submit their ideas for the apps they wanted to develop.
- 7 Community Energy groups and 17 businesses have been selected and will be implementing their proposals.

App showing demand across a village to enable local balancing.

App informing residents how to save money by using power at off-peak times.

Investigation on how smart appliances can provide flexibility to the grid.

# INNOVATION PROJECTS WITH COMMUNITIES

## Cornwall Local Energy Market

Development of platform (by Centrica) for flexibility services.

First UK DNO flexibility marketplace.

Platform will allow customers to alter generation/demand to benefit a third party.

## INNOVATION PROJECTS WITH COMMUNITIES

### Plugs and Sockets - Cornwall Local Energy Market

- The platform is live.
- WPD will be placing bids onto the platform and aggregators/businesses will be able to respond to them.
- The aim is to enable the DNO to remove constraints from the distribution network through the flexibility services others can offer.
- Participants can also access the platform as observers to see the requests for services and transactions.

## **Additionally...**

**We run 8 Community Energy Events every year at our key locations where community energy groups can come to find out what is happening in the industry and speak to us.**

**We have a dedicated Community Energy page with animations, guides, and podcasts on topics that Community Energy groups are interested in!**

## Summary

- WPD – DNO of Midlands, South West and Wales.
- We have a big portfolio of projects as part of our Innovation Strategy.
- We are currently running innovation projects that involve communities.
- The Open LV project is giving community energy groups access to LV data and the opportunity to run their own apps.
- We are taking part in the Cornwall Local Energy market which is trialling the first DNO platform for flexibility services in the UK.
- We are continuously supporting community energy through the events, animations, podcasts and guides we produce every year!

THANKS FOR LISTENING

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