

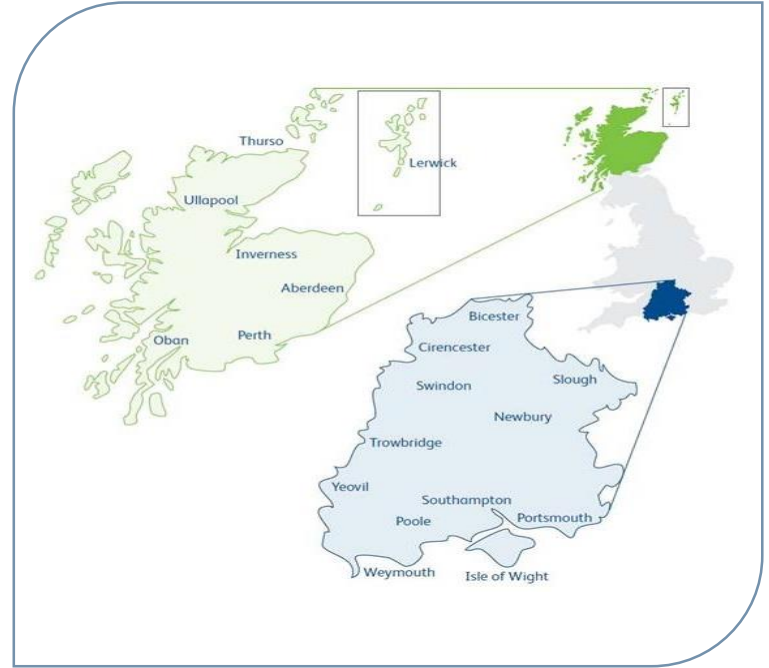
**STEWART REID**  
Head of DSO and Innovation

# SSEN overview

Scottish and Southern Electricity Networks owns:

- two electricity distribution networks
- one electricity transmission network
- +100,000 substations
- +130,000 km of overhead lines and underground cables
- +100 submarine cable links

We serve 3.5 million customers across one third of the UK's landmass.



# Our innovation portfolio



Demand Side Management



Energy Storage



Active Network Management



Constraint Managed Zone



Low Voltage Strategy



Distribution System Operator

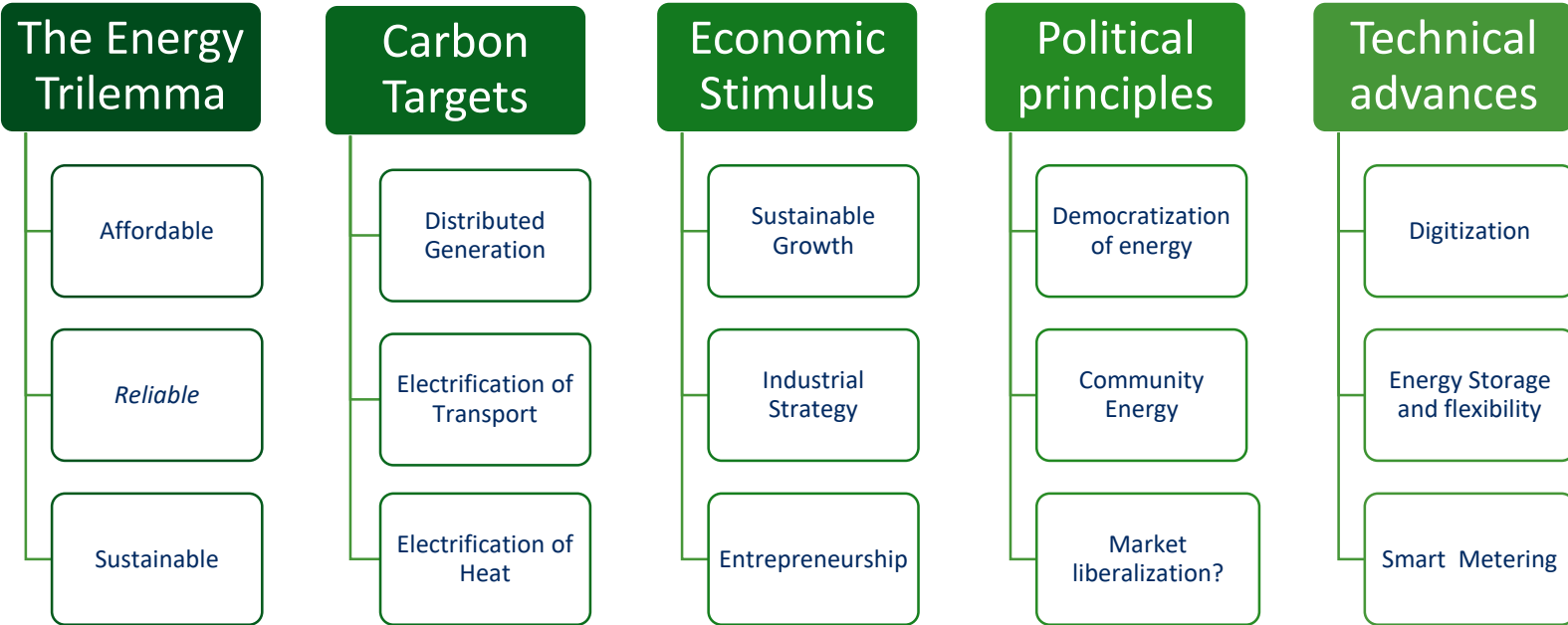


Customer Benefits

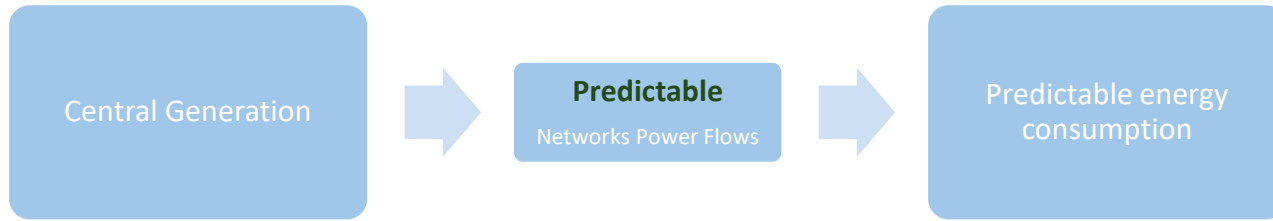
# The topic:

**‘Networks and flexibility, the challenge and the opportunity.’**

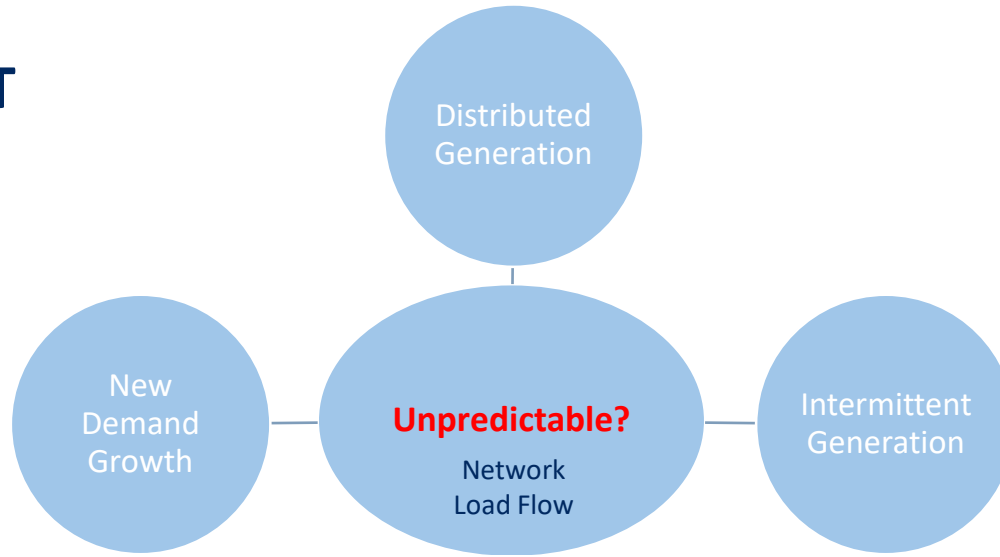
# The Primary Challenge.



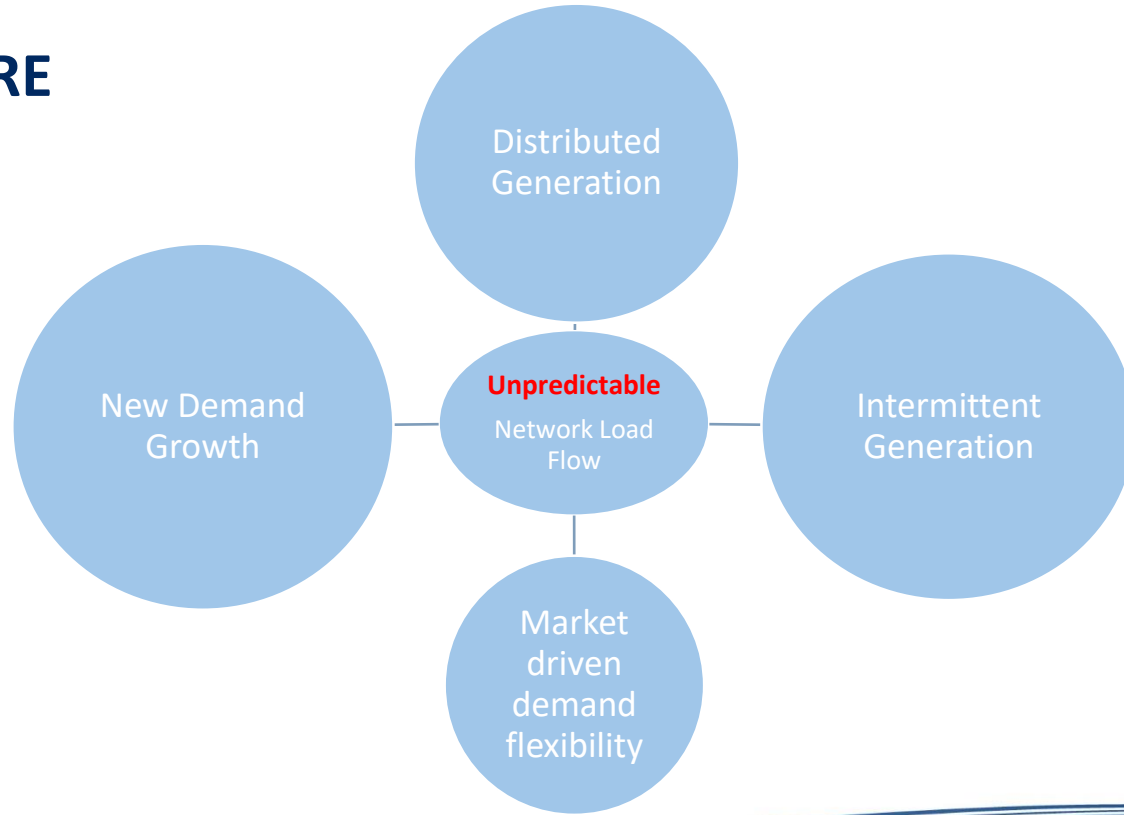
# PAST



# PRESENT



# FUTURE





# Challenges

Managing Congestion  
while facilitating Markets  
and new Technologies



Smart Solutions



Active Management



Price Signals



Network Investment



# Challenges

Customer acceptance?

Predicting customer behaviour?



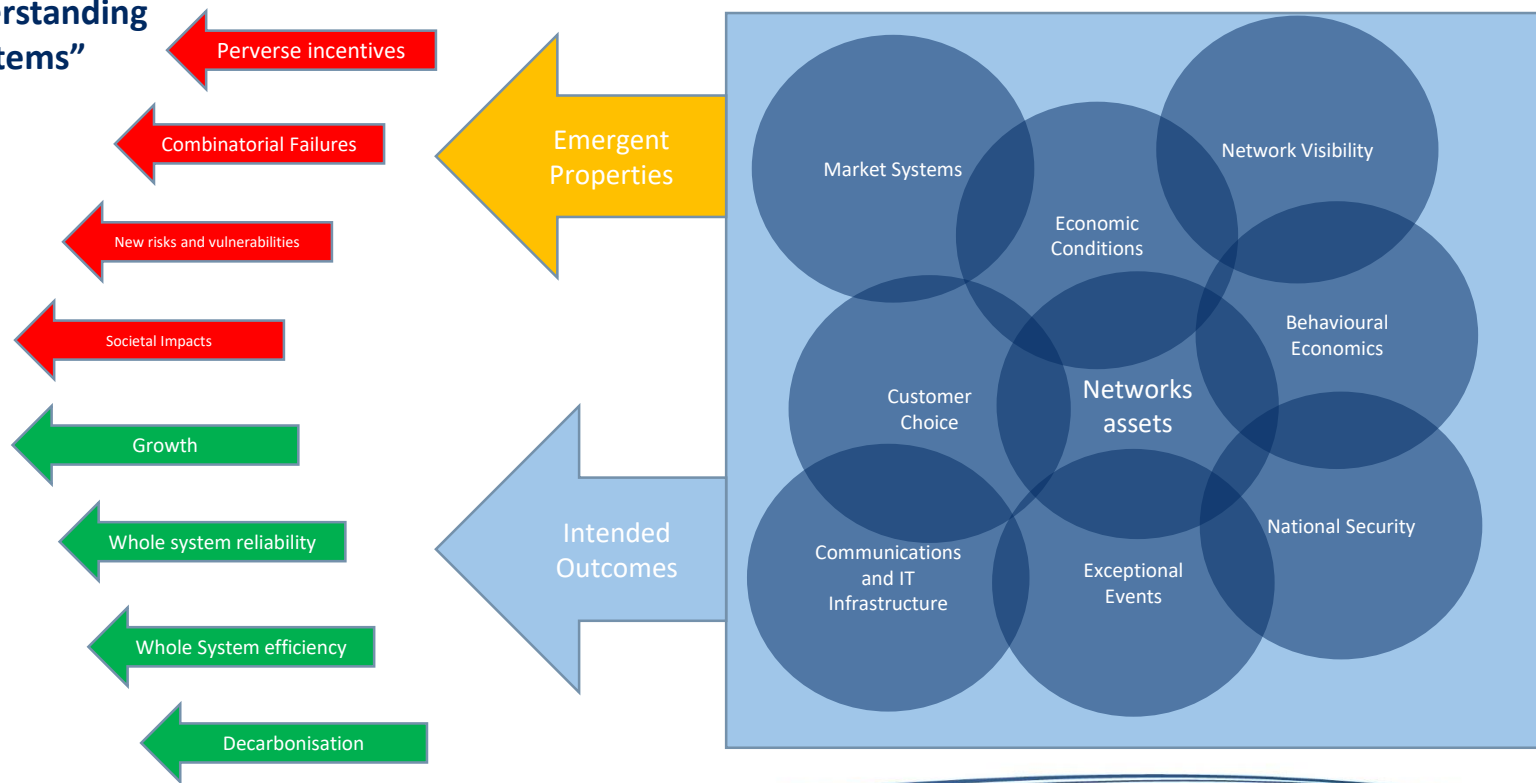
# Perspectives



- |   |   |   |
|---|---|---|
| • Reward those that have flexible demand  | ↔ | • Penalise those that cannot use demand flexibly  |
| • Stimulate markets                       | ↔ | • Create opportunities for gaming                 |
| • Maximise the utilisation of the network | ↔ | • Minimise the resilience of the network          |
| • Digitise the Energy System              | ↔ | • Increase system interdependencies               |
| • Enable Community energy trading         | ↔ | • Penalise those that don't belong to communities |
| • User pays                               | ↔ | • Remove the energy universal service obligation  |
| • Promote competition between DNOs        | ↔ | • Generate duplication                            |

# Challenges

Managing and understanding complex “Mega Systems”



# The Transition to Distribution System Operation

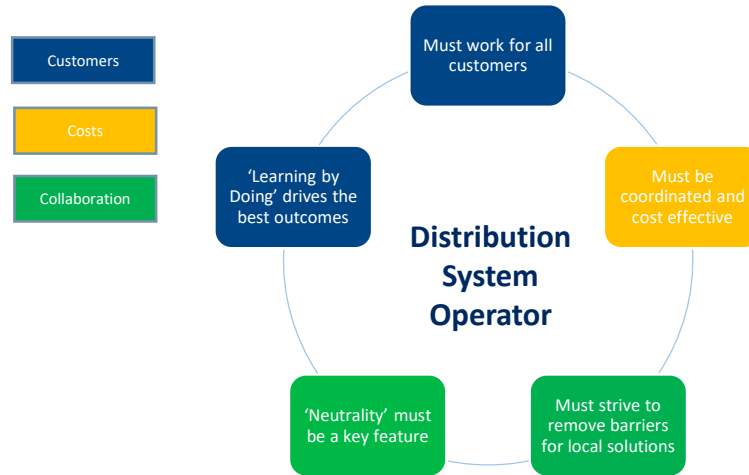
*“A Distribution Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation and other flexible distributed energy resources (DER).*

*As a neutral facilitator of an open and accessible market, it will enable competitive access to markets and the optimal use of DER on distribution networks to deliver security, sustainability and affordability in the support of whole system optimisation.*

*A DSO enable customers to be both producers and consumers; enabling customer access, customer choice and great customer service”.*

<b>ANM</b> Active Network Management	<b>CMZ</b> Constraint Managed Zone	<b>DER</b> Distributed Energy Resources	<b>DNO</b> Distribution Network Operator
<b>DSO</b> Distribution System Operator	<b>DSR</b> Demand Side Response	<b>DUoS</b> Distribution Use of System	<b>ENA</b> Energy Networks Association
<b>GSP</b> Grid Supply Point	<b>NETSO</b> National Electricity Transmission System Operator	<b>NIA</b> Network Innovation Allowance	<b>NIC</b> Network Innovation Competition
<b>NINES</b> SSEN's Northern Isles New Energy Solutions project	<b>SAVE</b> SSEN's Solent Achieving Value from Efficiency project	<b>TO</b> Transmission Operator	<b>TSO</b> Transmission System Operator

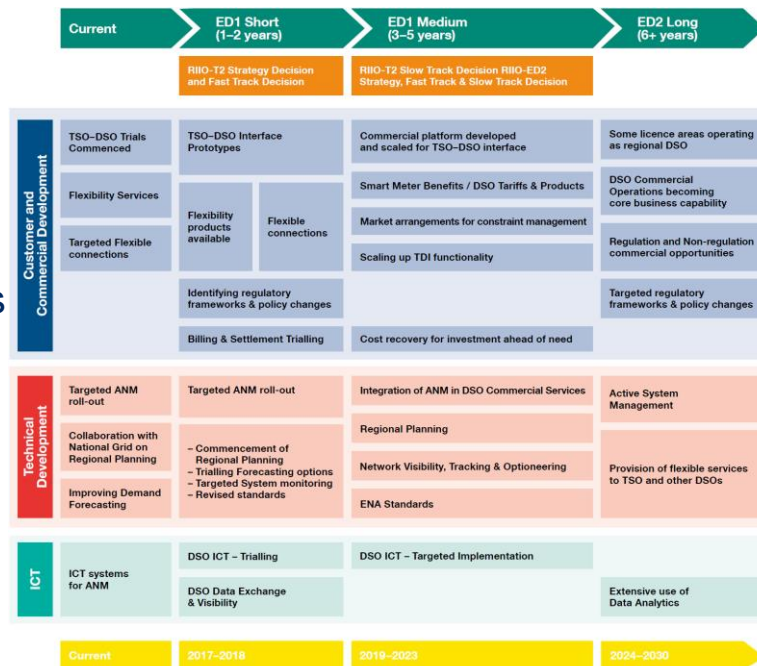
# Our DSO Principles





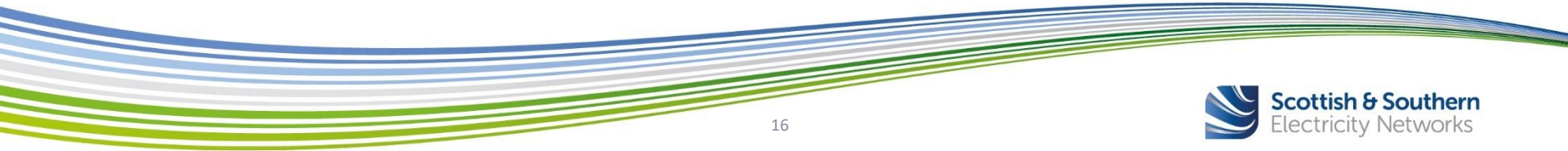
# DSO Roadmap & Market Modelling

- We have set out a roadmap for evolution
- We are currently modelling 5 market models
- Define the options, then understand costs and benefits of each to feed into future Ofgem & Government consideration of policy/regulatory framework
- Undertaking Impact Analysis of the models



The Roadmap ensures that network operators are moving at an appropriate pace and customers and opportunities are being made available to flexibility service providers.

There are activities happening now to contract for flexibility services at DNOs.





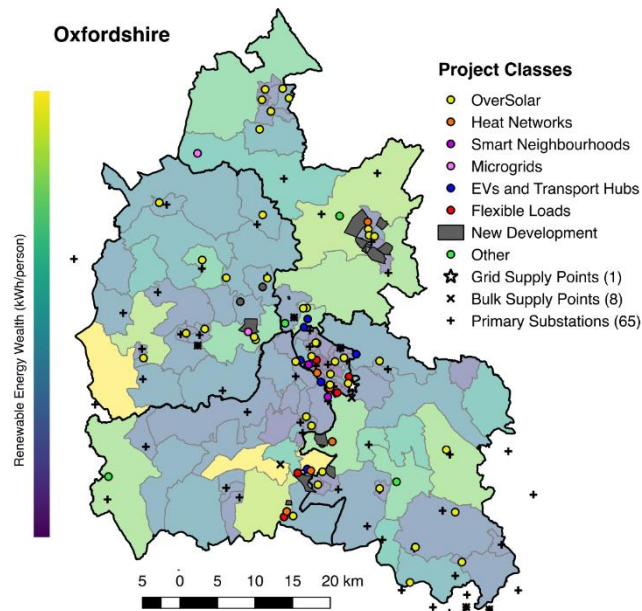
# TRANSITION in Oxfordshire

TRANSITION proposes to deliver a trial in Oxfordshire, coordinating with Project LEO (Local Energy Oxfordshire) to enhance overall learning value.

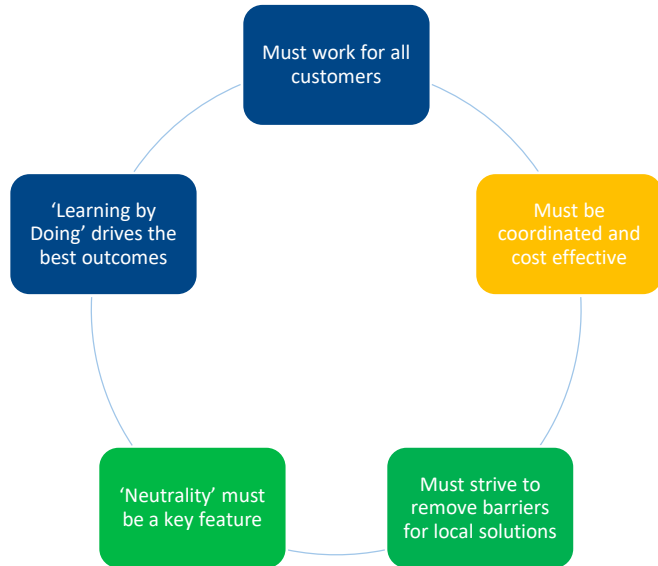
Project LEO provides a £40m programme. The requested £13m Innovate UK grant funding is matched by £27m private sector funding, and further leveraged by £46m public sector investment.

Project LEO will be led by SSEN and delivered with the following varied and active partners:

- **University of Oxford**
- **Oxford Brookes University**
- **The Low Carbon Hub**
- **Oxfordshire County Council**
- **Oxford City Council**
- **Open Utility**
- **Origami Energy**
- **EDF Energy**
- **Nuvve**



# In conclusion



Irrevocable challenges are being placed on all Energy networks.

There is no single solution.

The solutions bring their own challenges, winners and losers.

Demonstration and incremental learning is key to confirm intended consequences.

Customers are key to the solution; it is about what happens on the other side of the meter!

Systems thinking is key.

The Industry is responding and co-ordinated.



<https://www.ssepd.co.uk/Innovation/>

# Thankyou

<http://www.smarternetworks.org/>

