

Unlocking the potential of distributed energy

Brian Spak | Leader – Grids and Renewable Integration

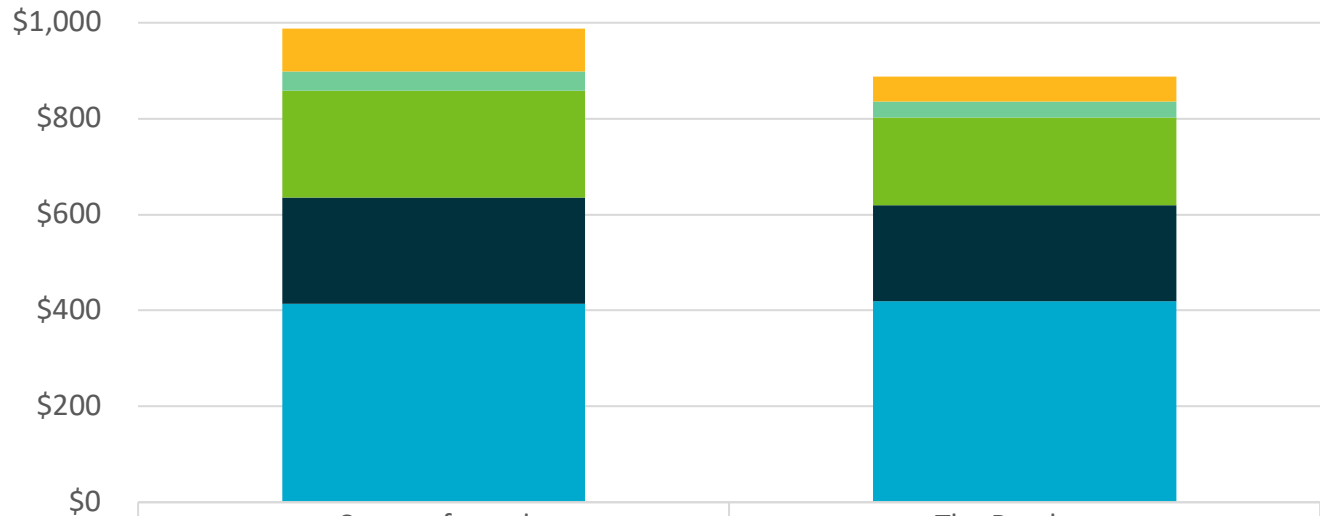
10 April 2018

CSIRO ENERGY
www.csiro.au



Leveraging distributed energy can lead to \$100 billion in savings

Cumulative Electricity System Total Expenditure to 2050 (\$billion)



	Counterfactual	The Roadmap
Off-grid (metering, control, storage, disconnected generation)	\$89	\$53
Transmission	\$40	\$33
Distribution	\$223	\$183
Distributed generation	\$222	\$200
Centralised generation	\$414	\$419

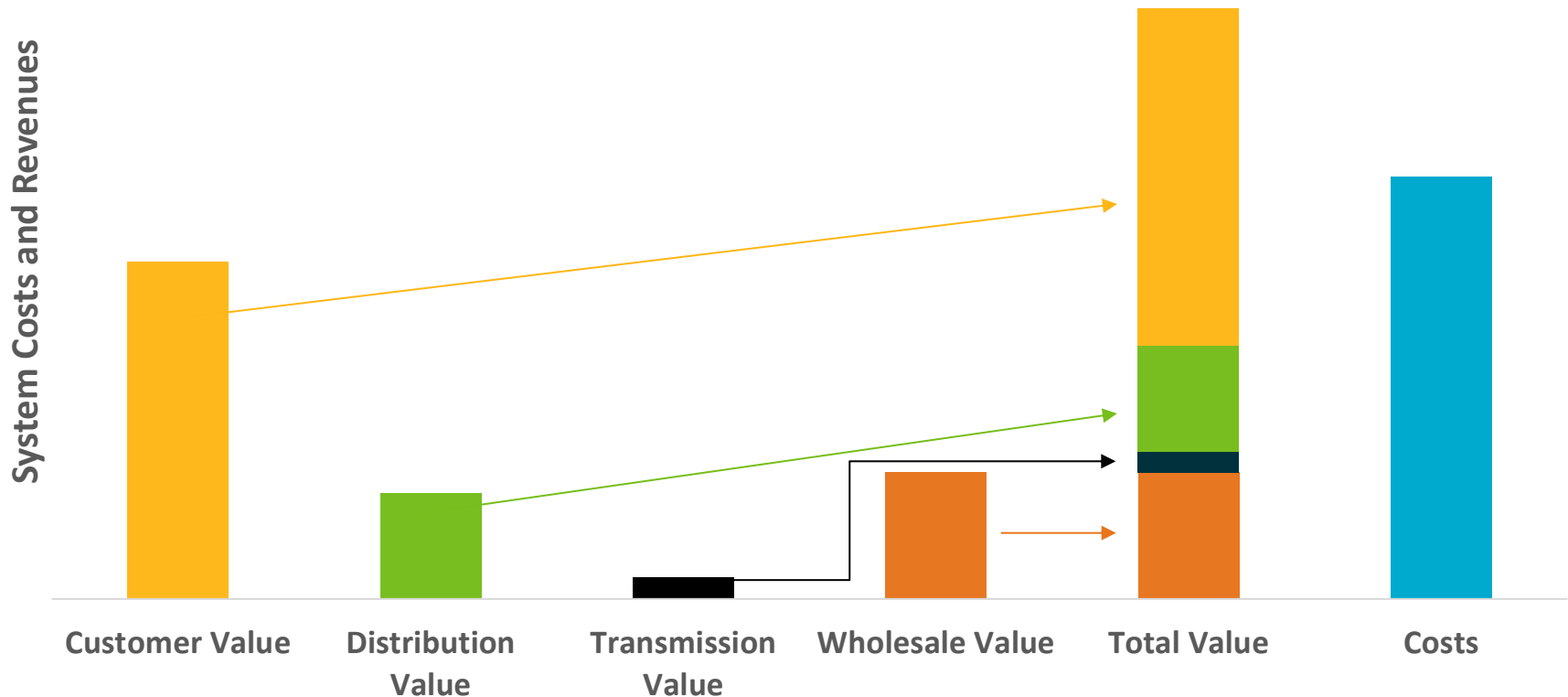
Source: Electricity Network Transformation Roadmap, CSIRO and ENA, April 2017

Distributed energy can provide many values to the energy system, but isn't operated or paid to provide most of that value today.

Grid Domain	Services provided by DERs	Easily Monetizable?
Customer	Customer Energy Services	Yes
	Bill Management	Yes
	Backup Power	Yes
Distribution	Distribution Capacity Deferral	No
	Voltage Management	No
	Network congestion management	No
	Reliability	No
Transmission	Transmission Capacity Deferral	No
Wholesale Market	Bulk Energy	Yes
	Frequency Management	Yes
	Strategic Reserves (Reliability/Bulk Capacity)	No
	Operating Reserves (Spin/non-spin reserves)	No
	System Restart Services	No

Stacking benefits increases customer value

Hypothetical Distributed Energy Cost-Benefit Analysis



Distributed Energy includes energy efficiency, distributed batteries, load management (including demand response), and renewable, distributed generation.