



Smart Grid, Smart City

National Cost Benefit Assessment

25th November 2014 – AIE Event

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ENERGEIA

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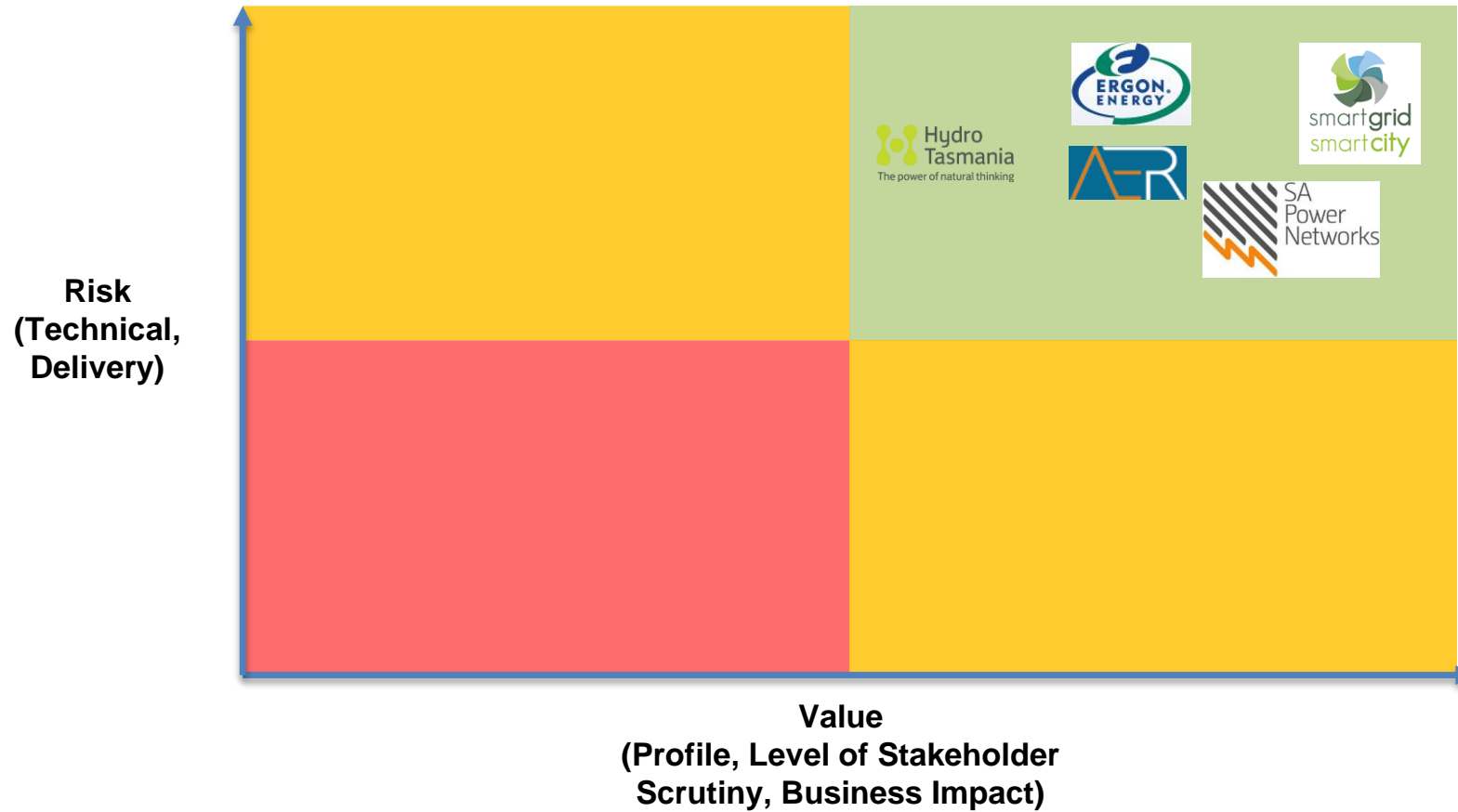
Overview

- Approach to *Smart Grid, Smart City* National Cost Benefit Assessment
- Outlook and technology optimisation results
- Developments since SGSC and implications



- Founded in 2009 in Sydney, now largest specialist consultancy in Australia
- 15 full-time experts based in Sydney, with network of distinguished experts
- We seek out transformative projects which, by their nature:
 - Are technically high risk
 - Have high strategic value

Energeia



A background image featuring several white wind turbines of varying sizes against a clear blue sky. A bright sun is visible in the upper right corner, creating a lens flare effect. The overall scene is bright and clean, representing renewable energy.

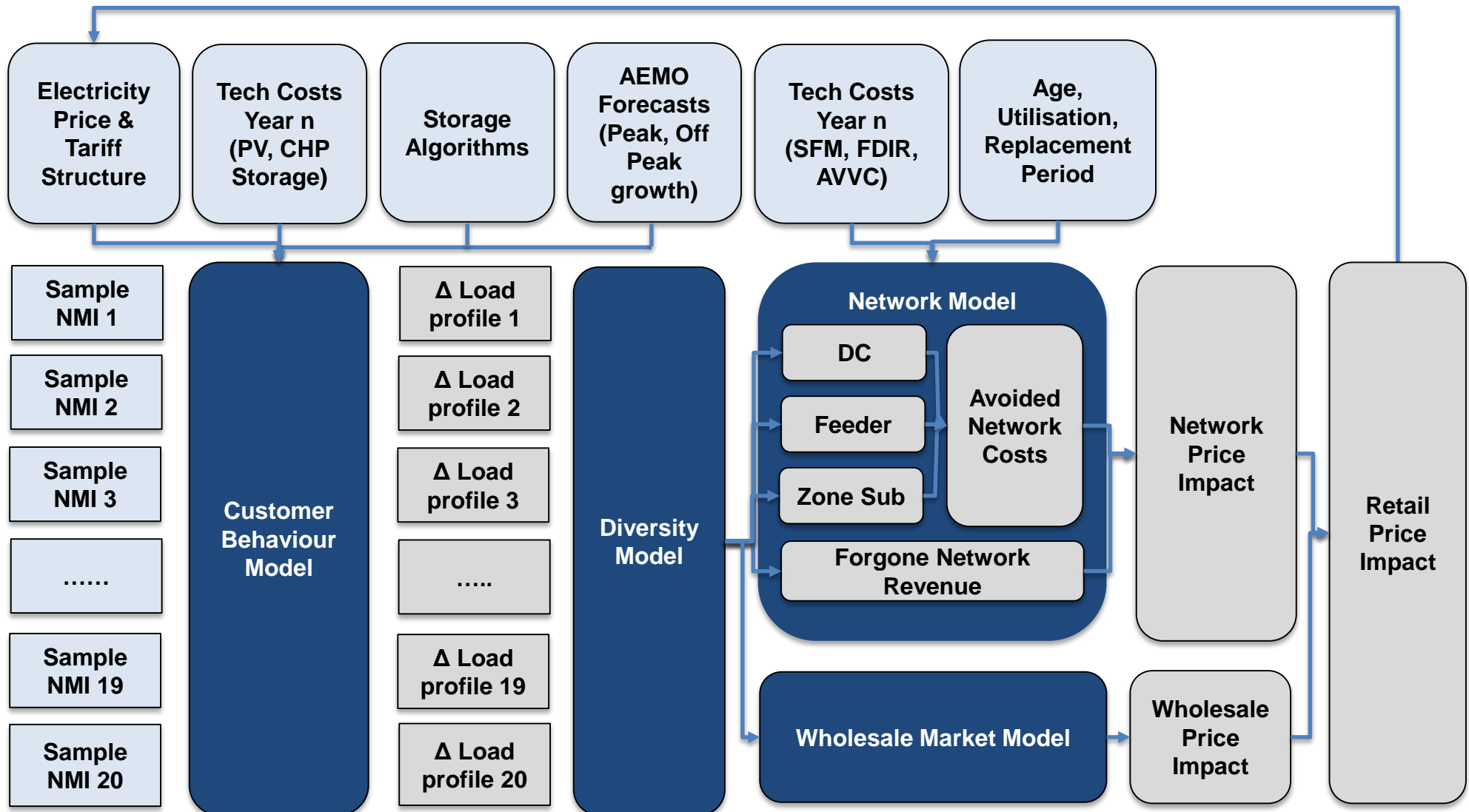
Smart Grid, Smart City



National Cost Benefit Assessment

What is our independent, informed assessment of the Business Case for the deployment of an integrated Smart Grid in a national context?

Integrated Benefits Model

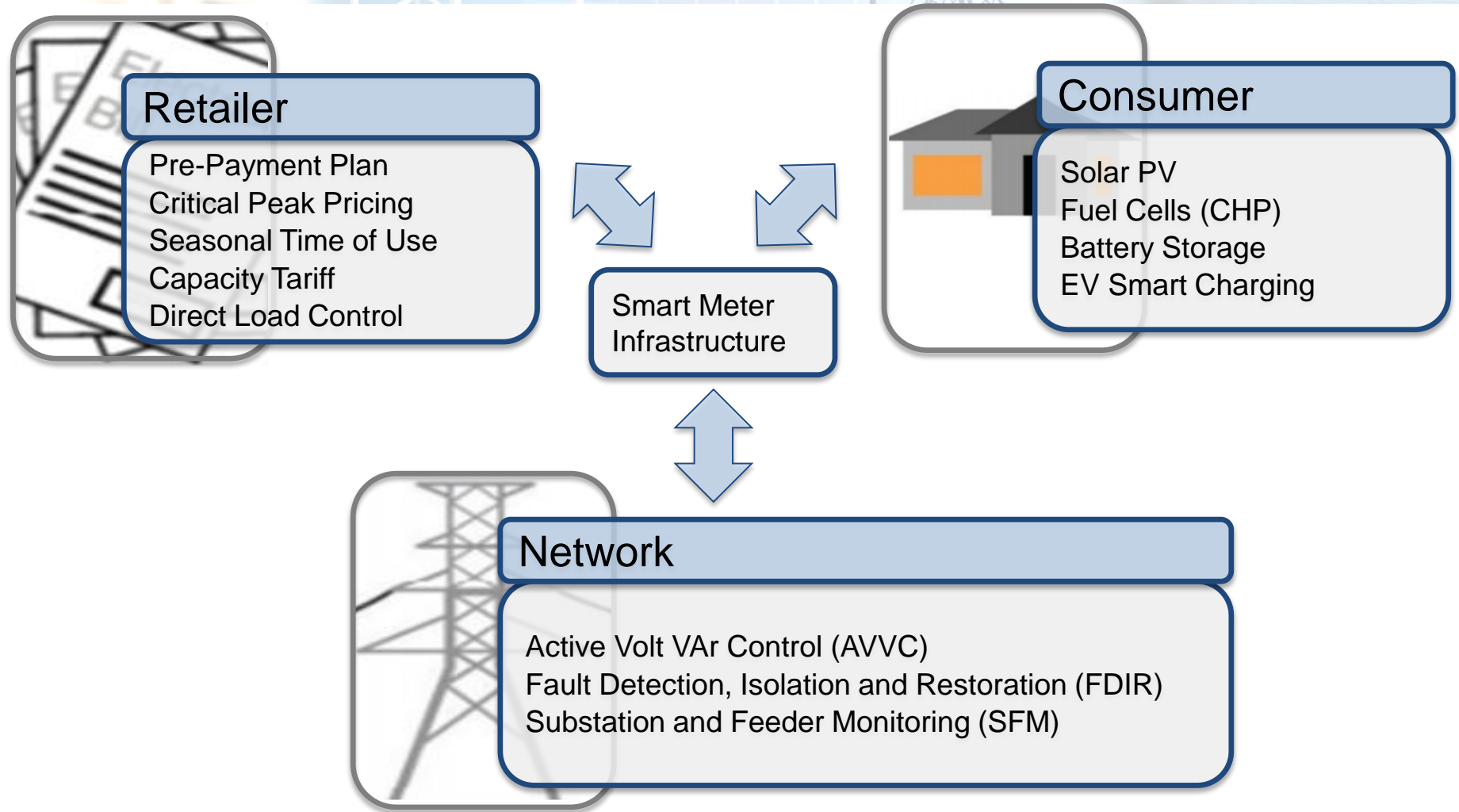




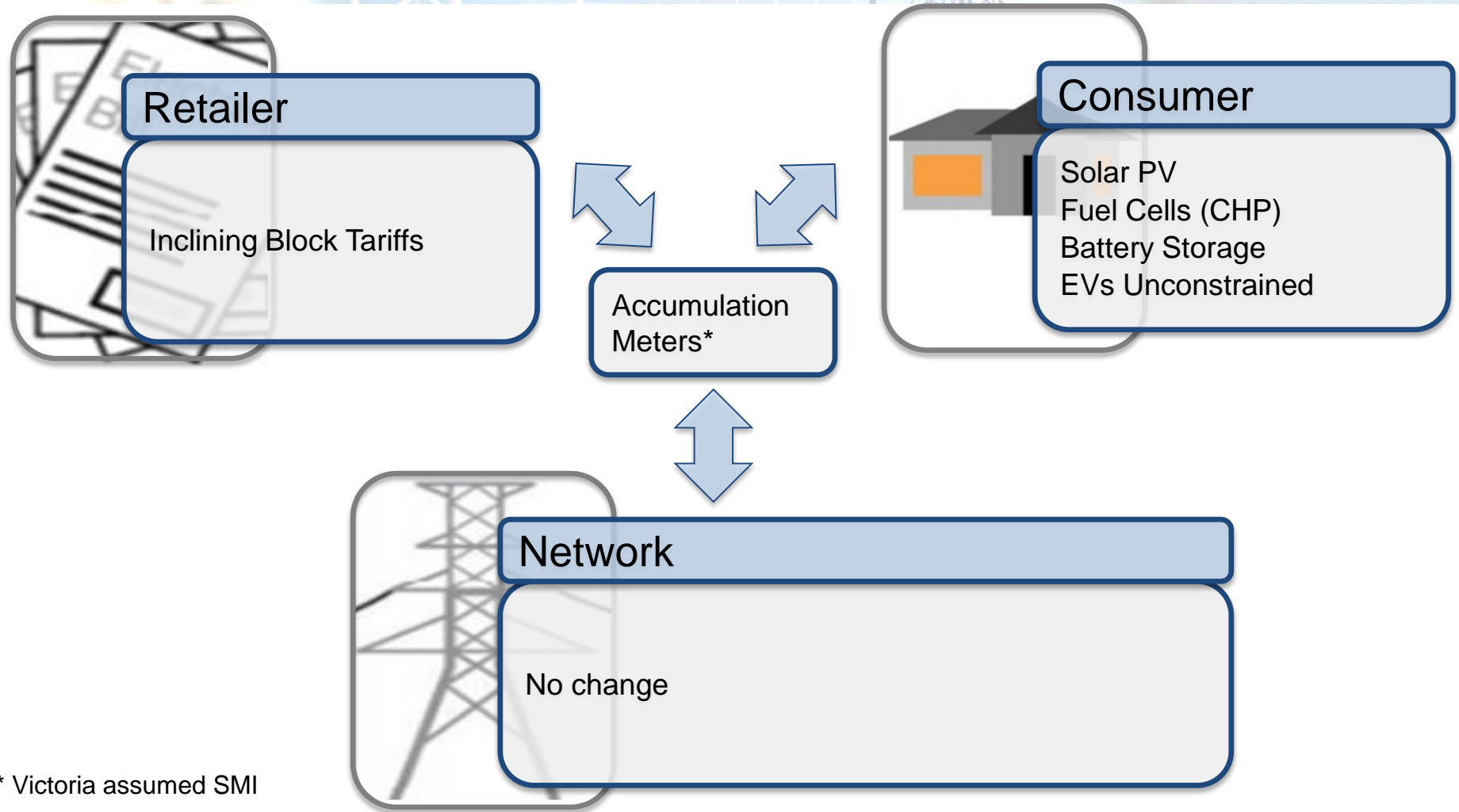
Model Scope

- Six states
- Three scenarios (H,M,L economic growth)
- 5 time intervals (2014 to 2034)
- 1.5 weeks per model run
- 18 virtual machines (courtesy of Ausgrid)
-and then a re-run!

Smart Grid Technologies Assessed



Business as Usual

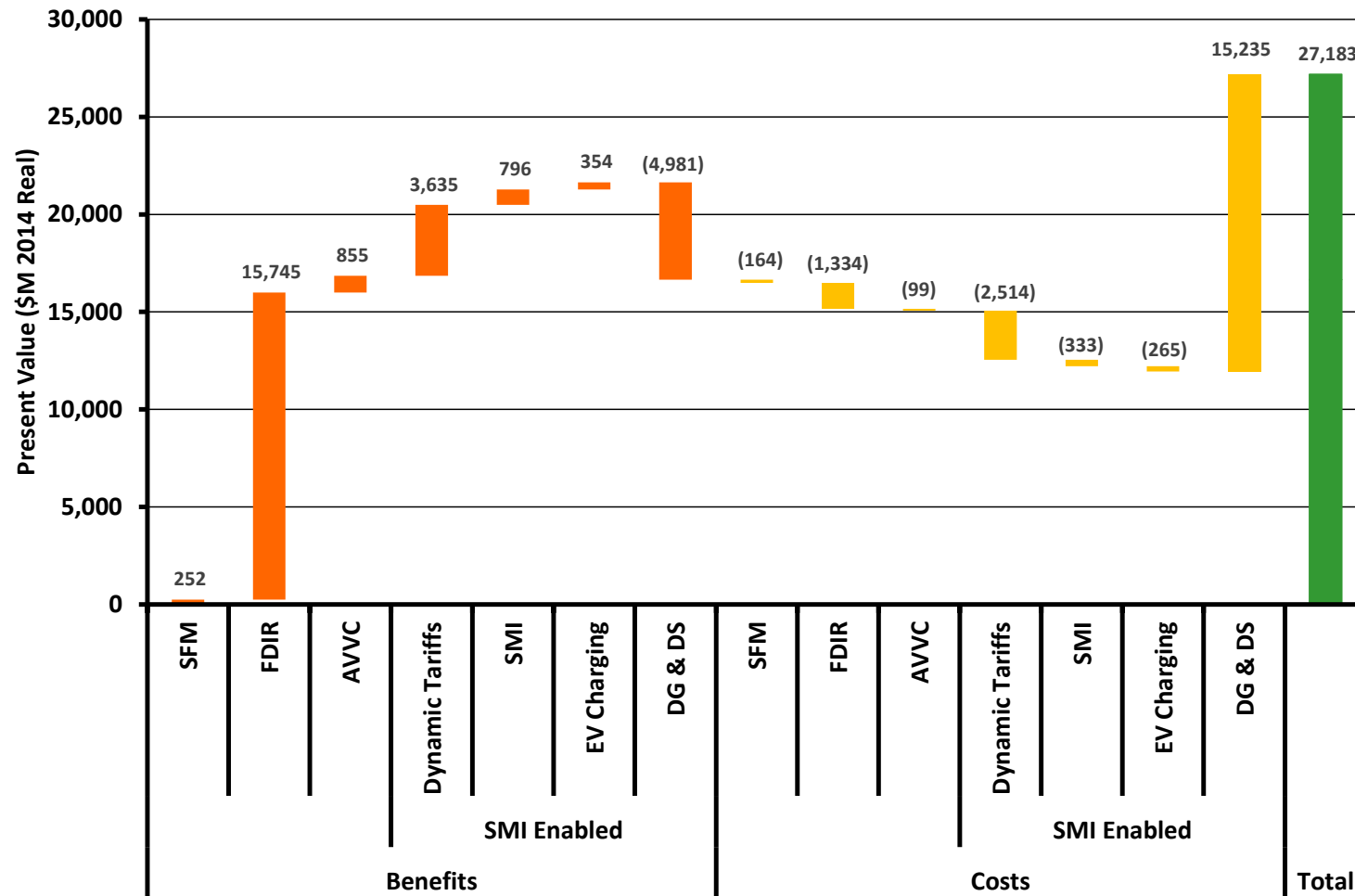


* Victoria assumed SMI

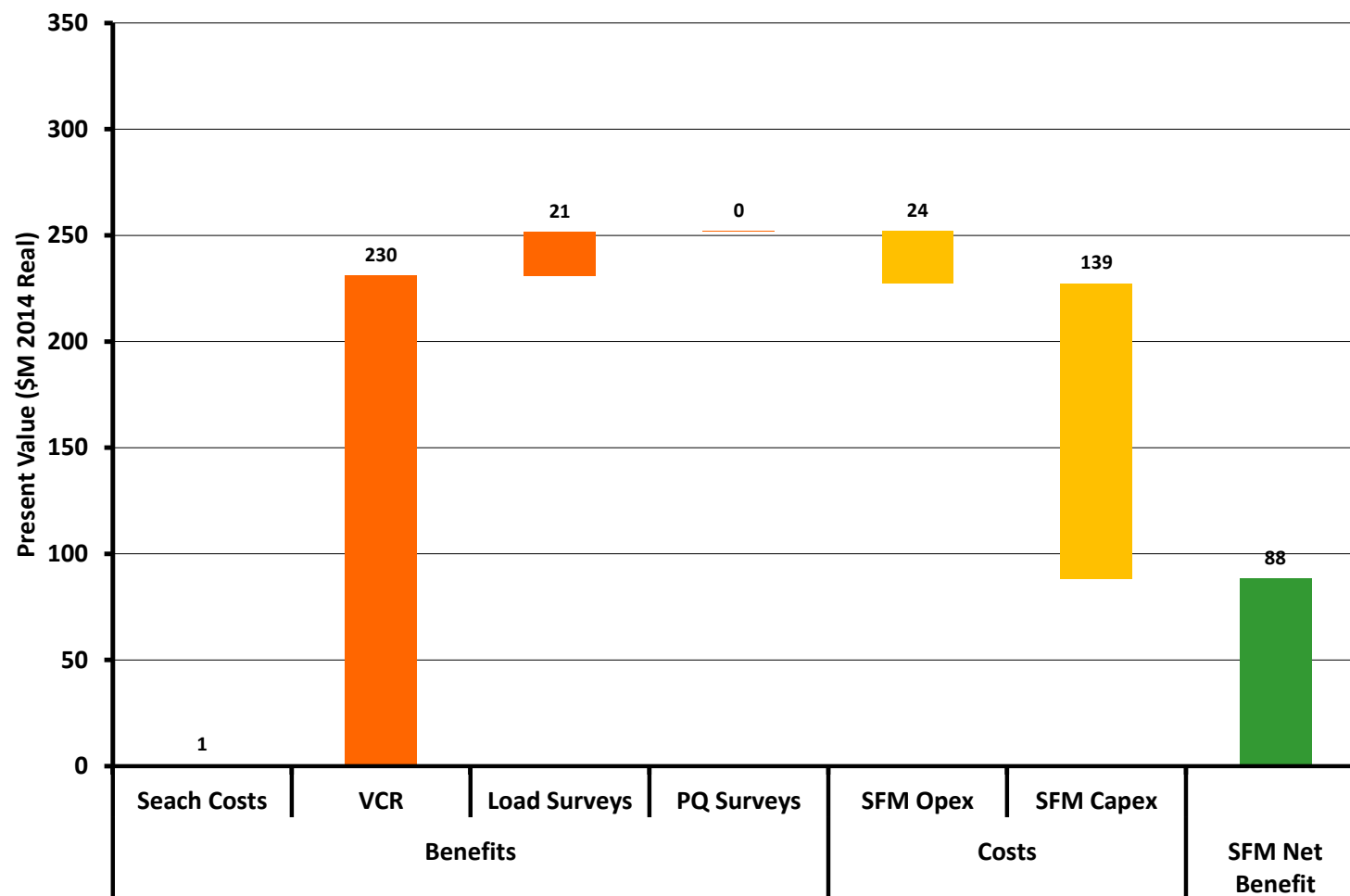
The background of the slide features a light blue sky with a bright sun in the upper right corner, creating a lens flare effect. Several white wind turbines are visible, with one in the foreground being the most prominent and slightly out of focus, and others receding into the distance.

Medium Scenario Outlook

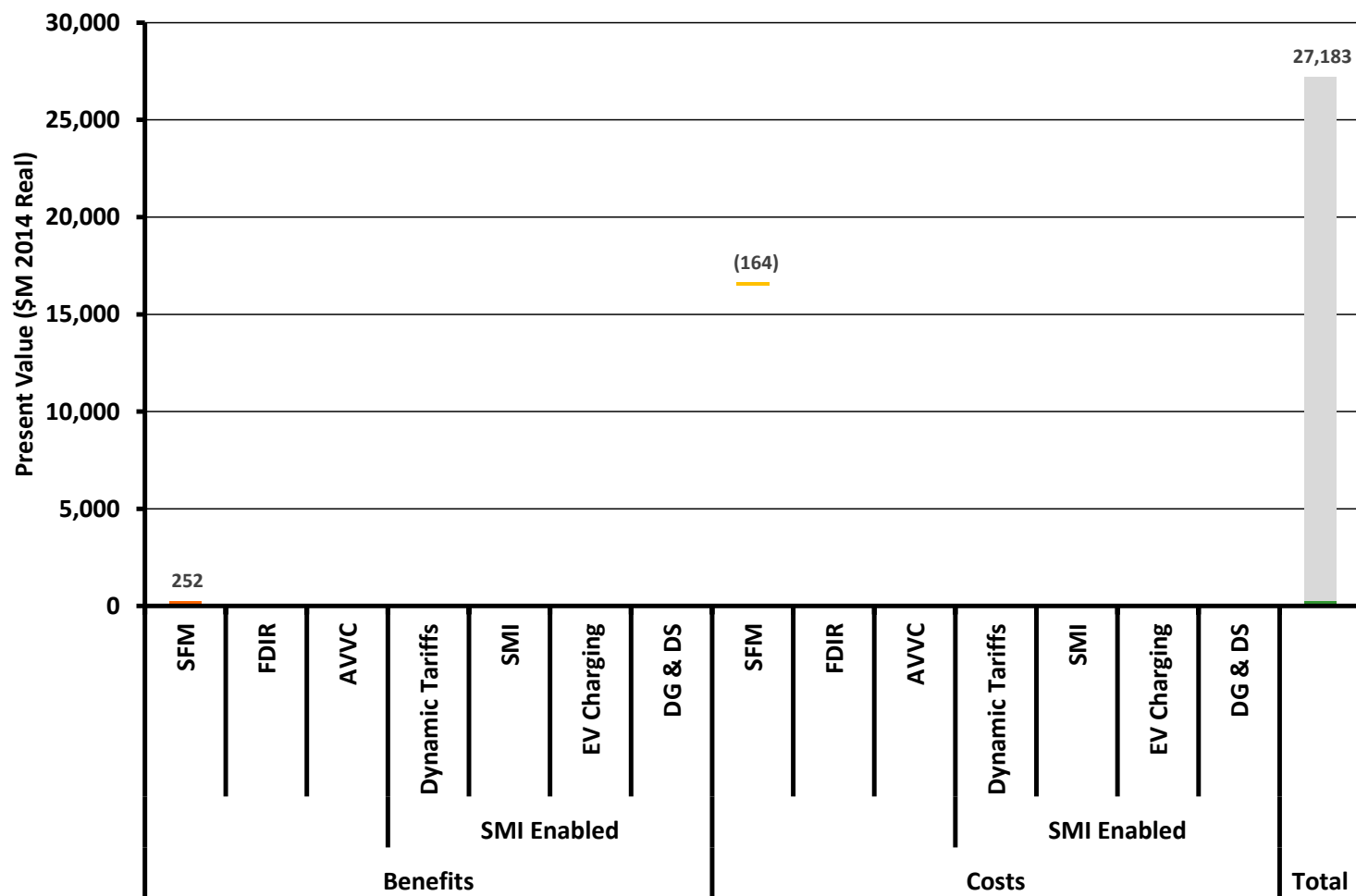
National Cost Benefit Assessment



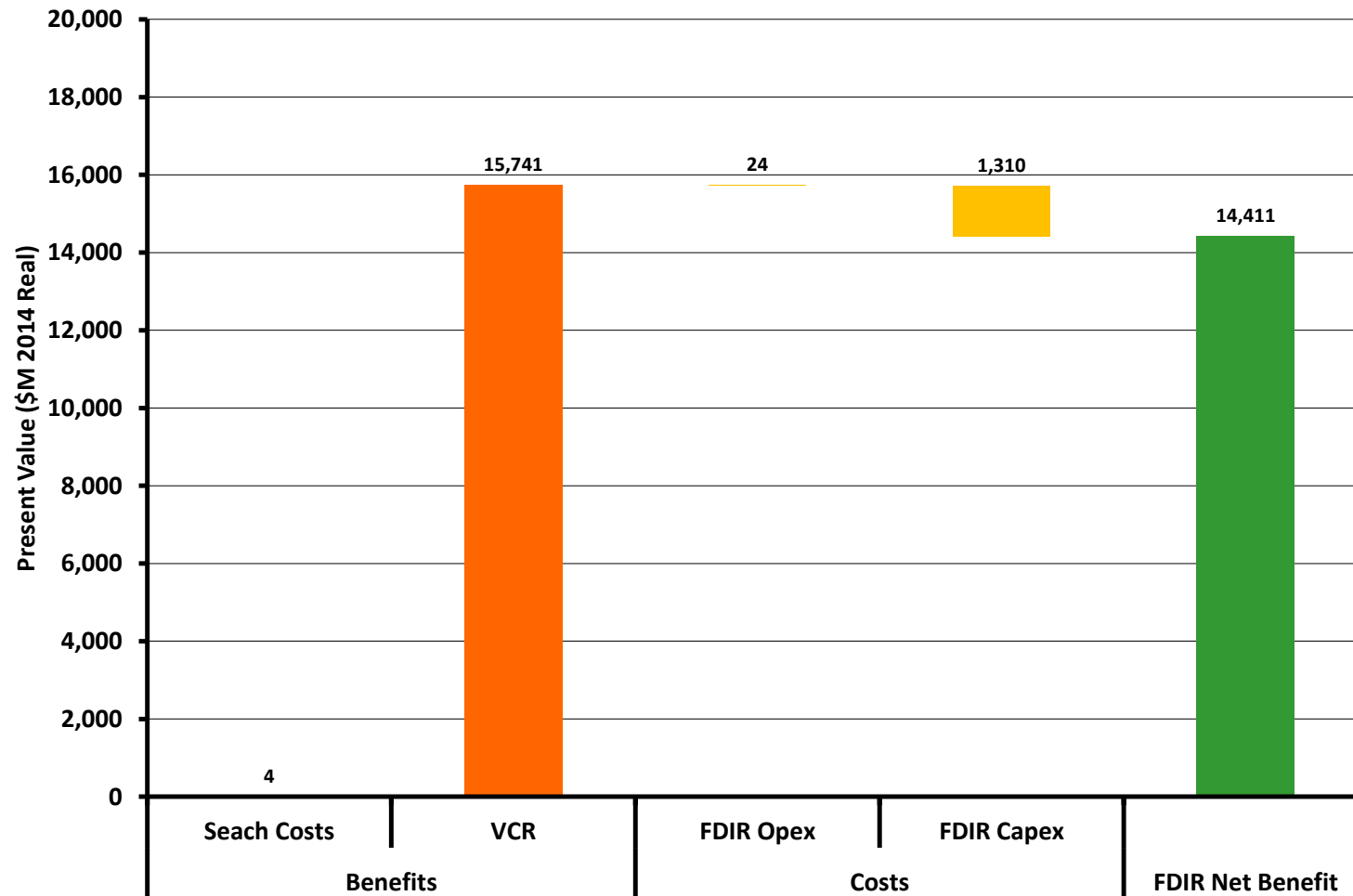
Substation and Feeder Monitoring



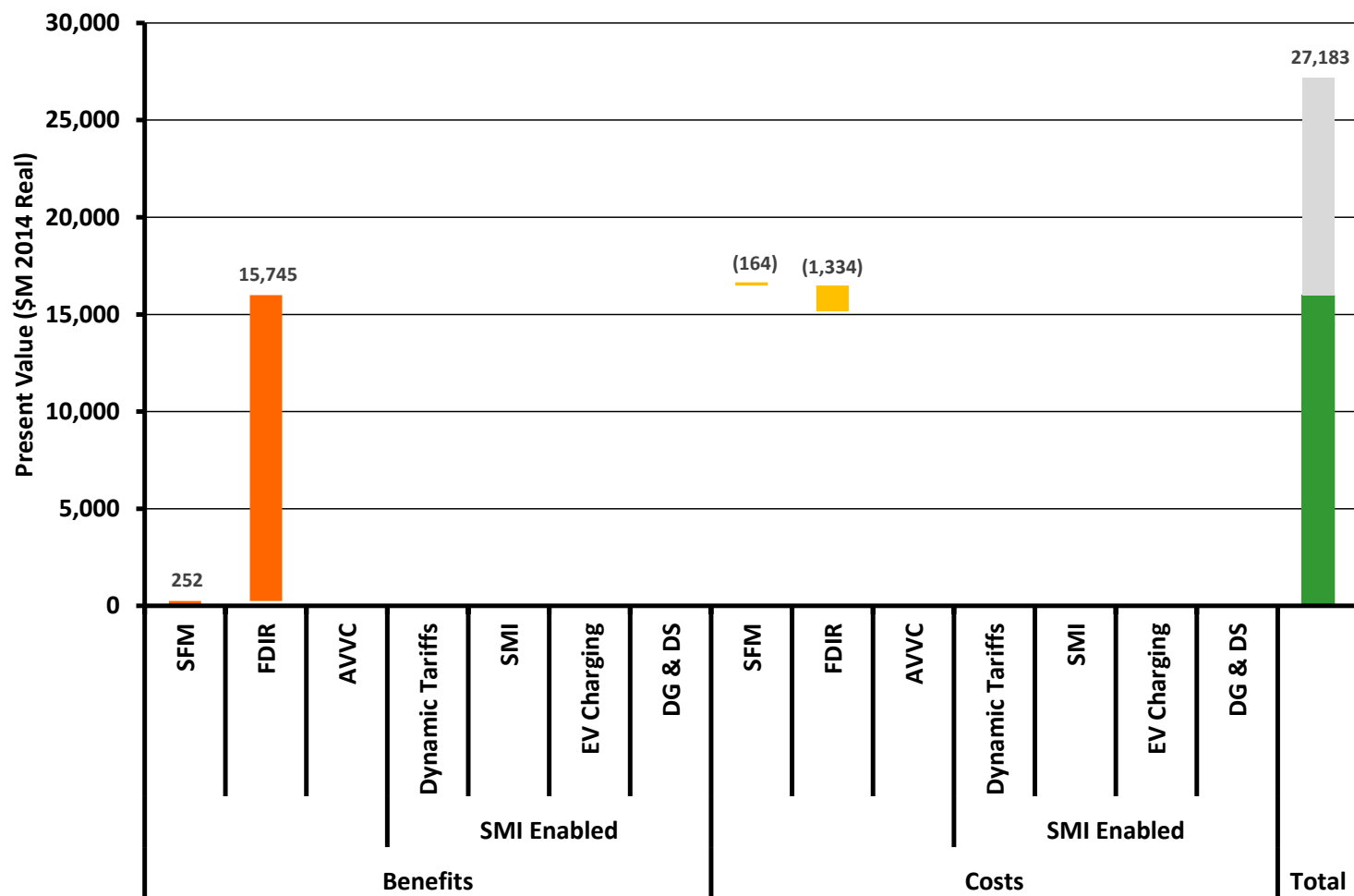
Contribution to National Net Benefit



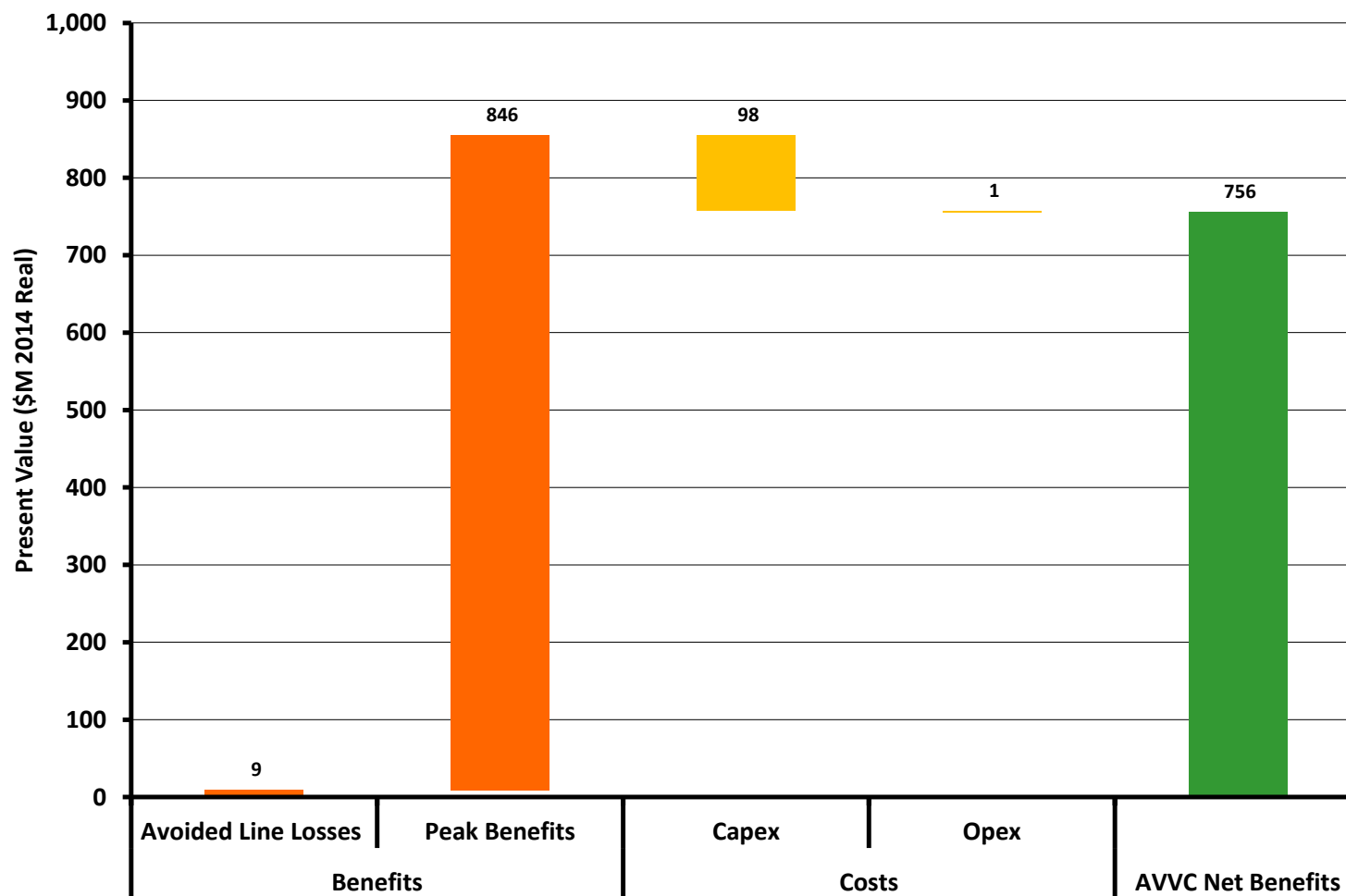
Fault Detection, Isolation and Restoration



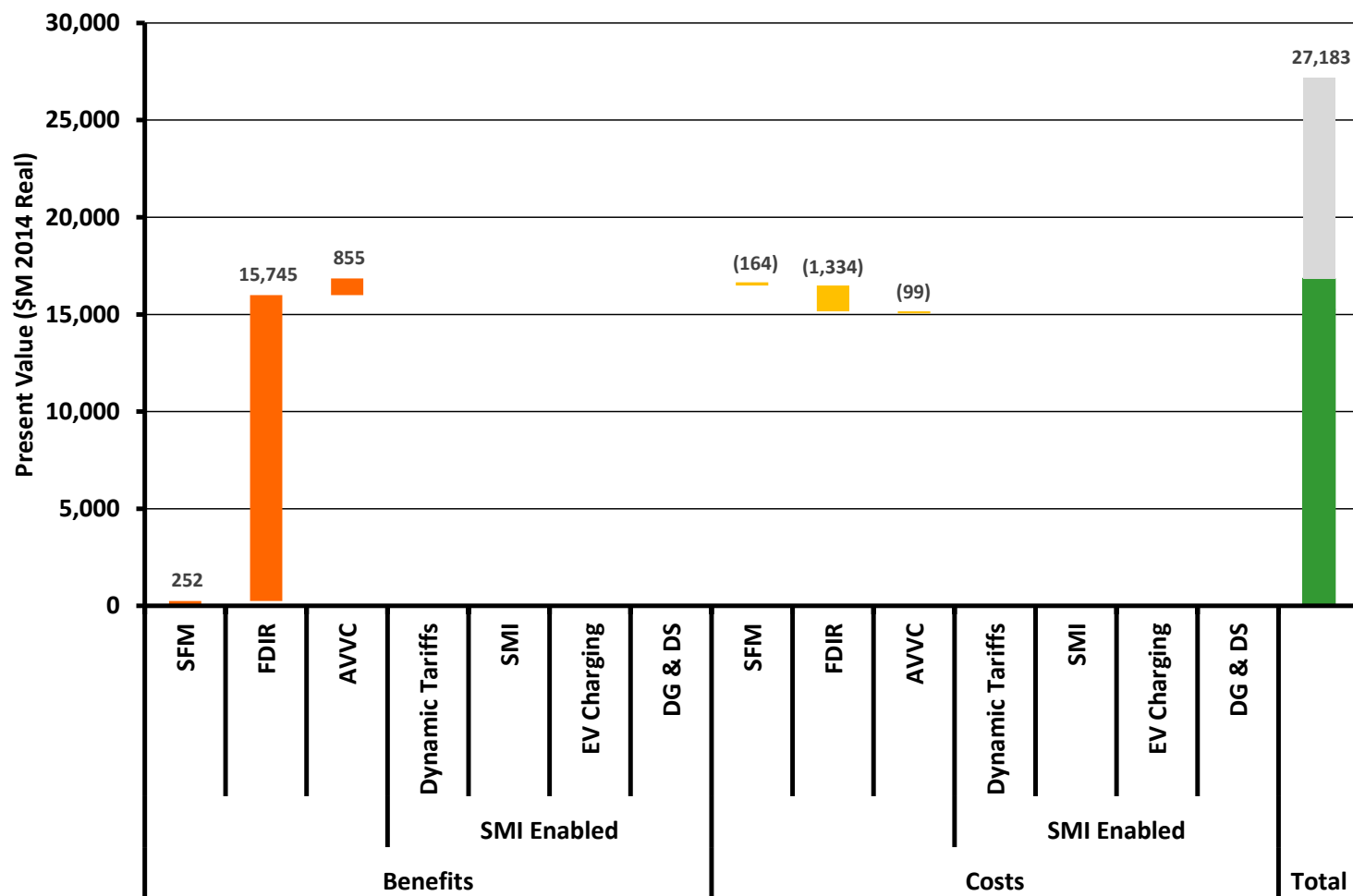
Contribution to National Net Benefit



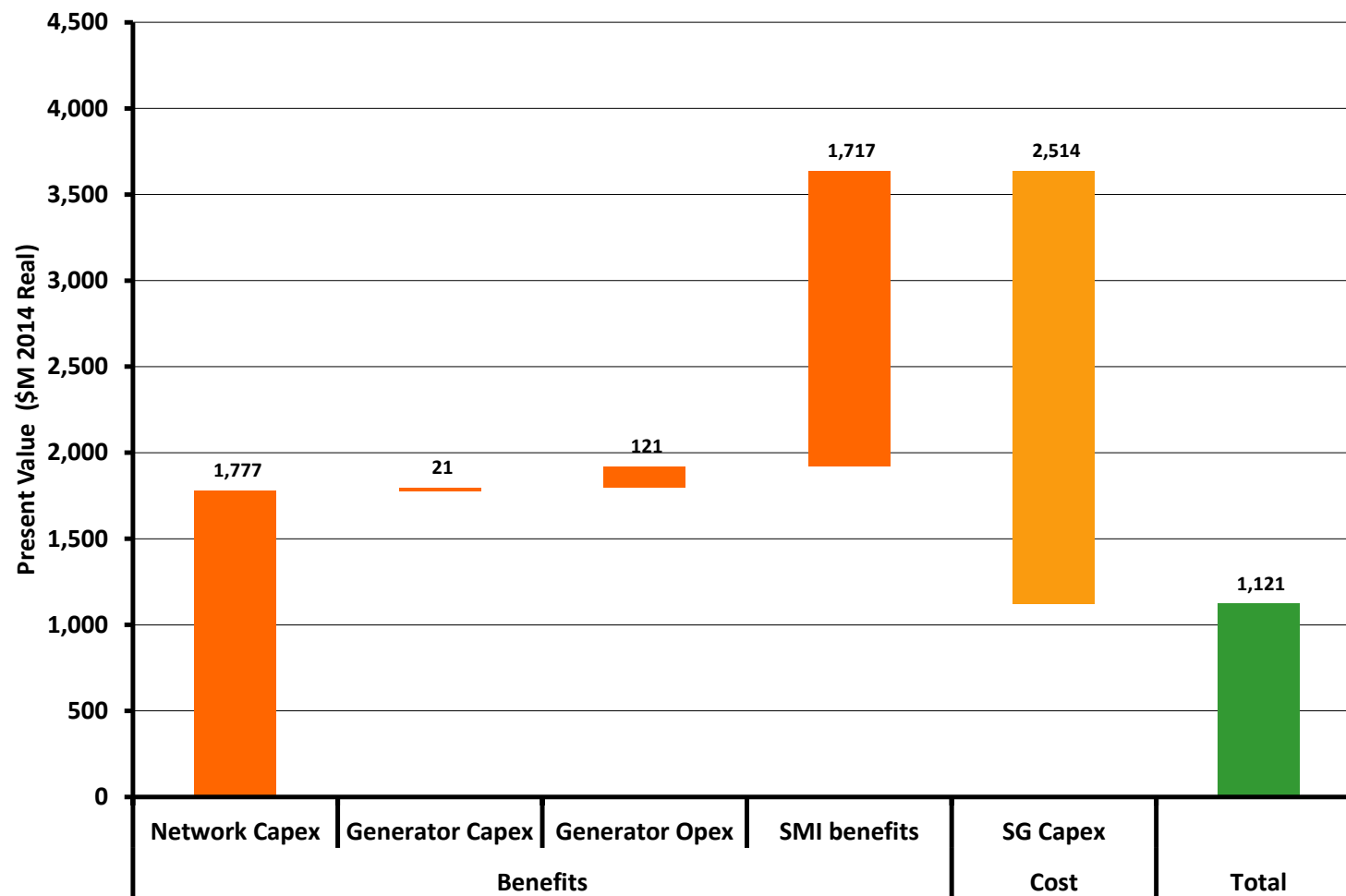
Active Volt VAr Control



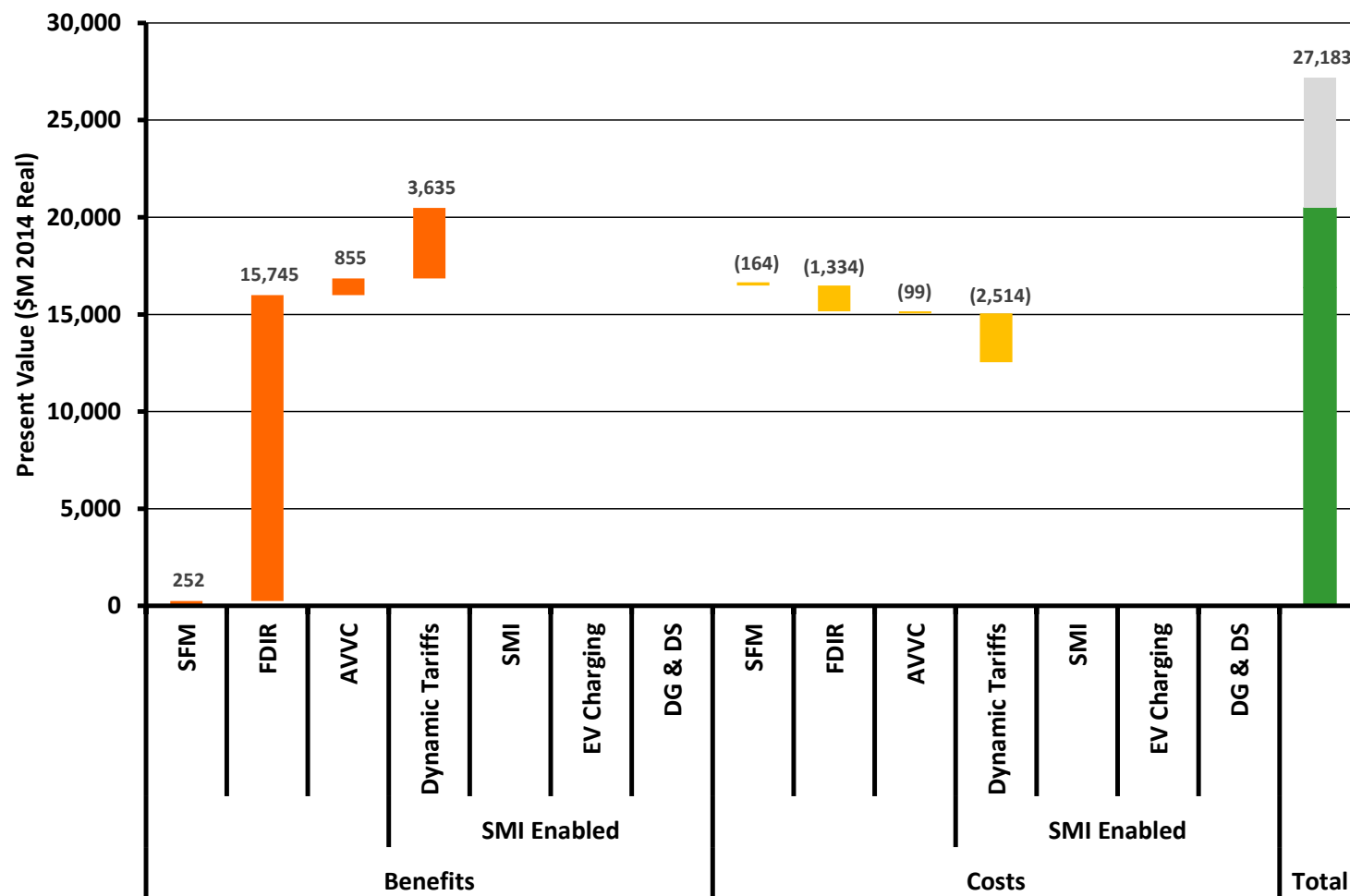
Contribution to National Net Benefit



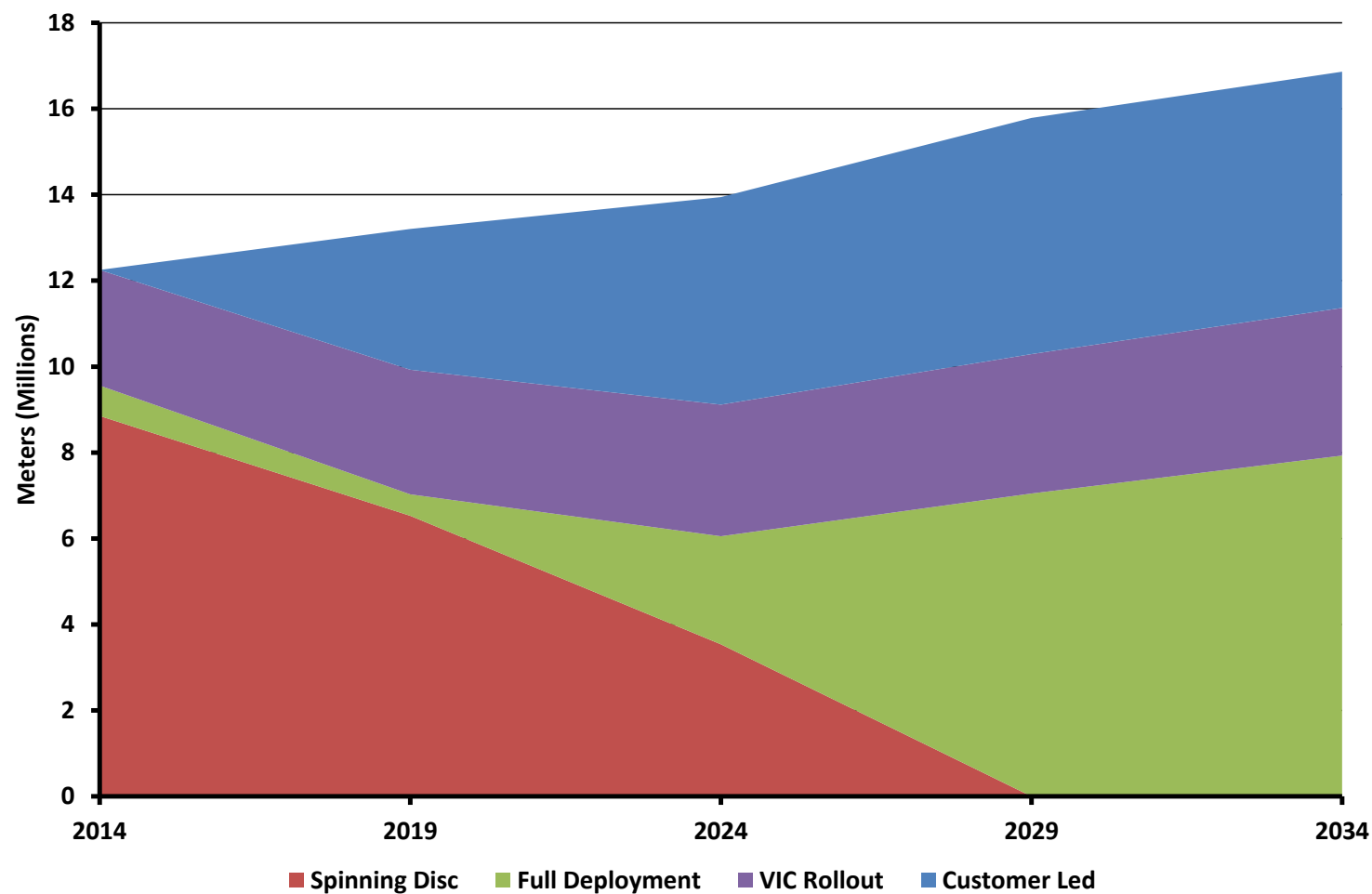
Tariffs and Products



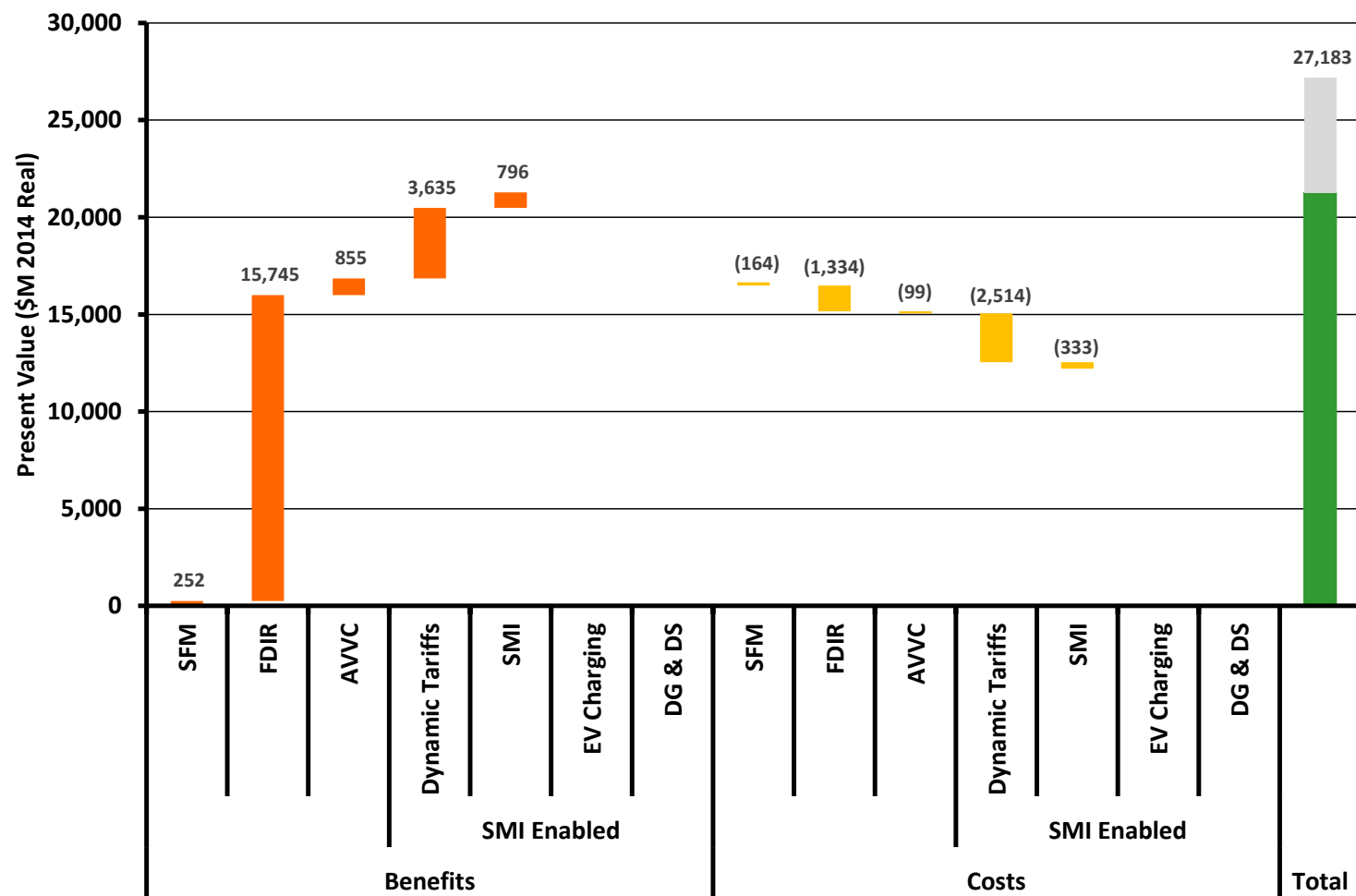
Contribution to National Net Benefit



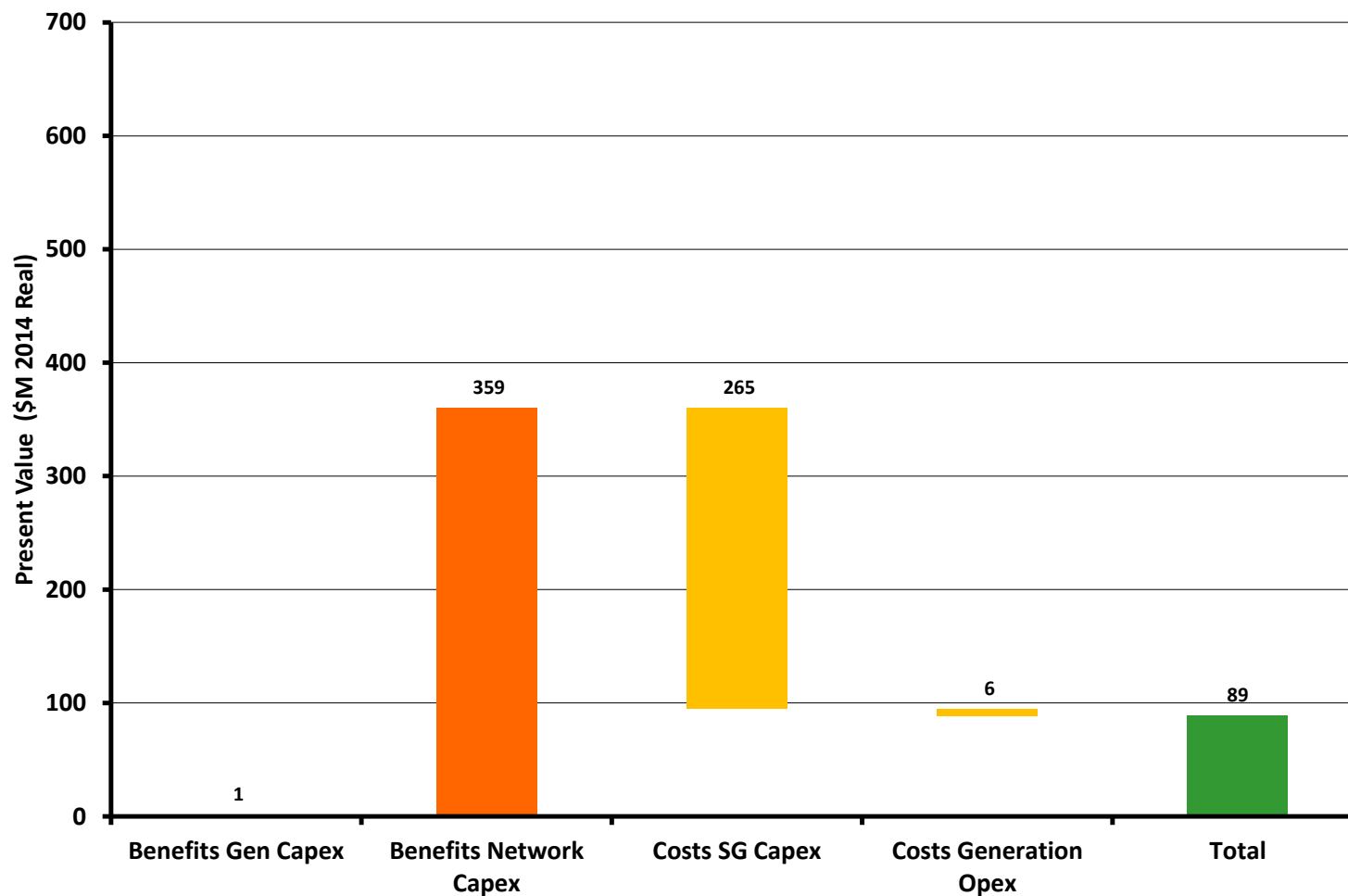
Smart Meter Penetration



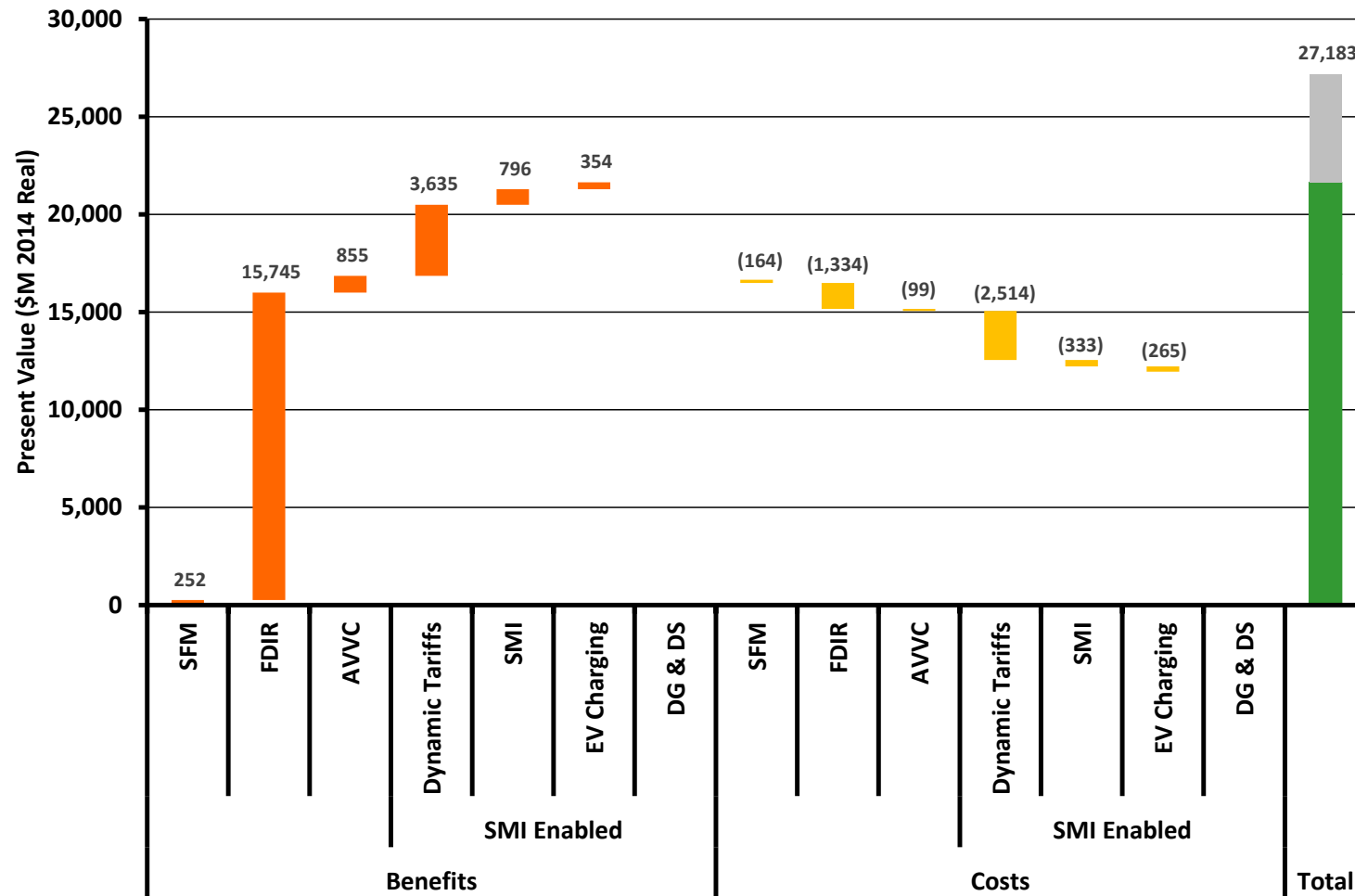
Contribution to National Net Benefit



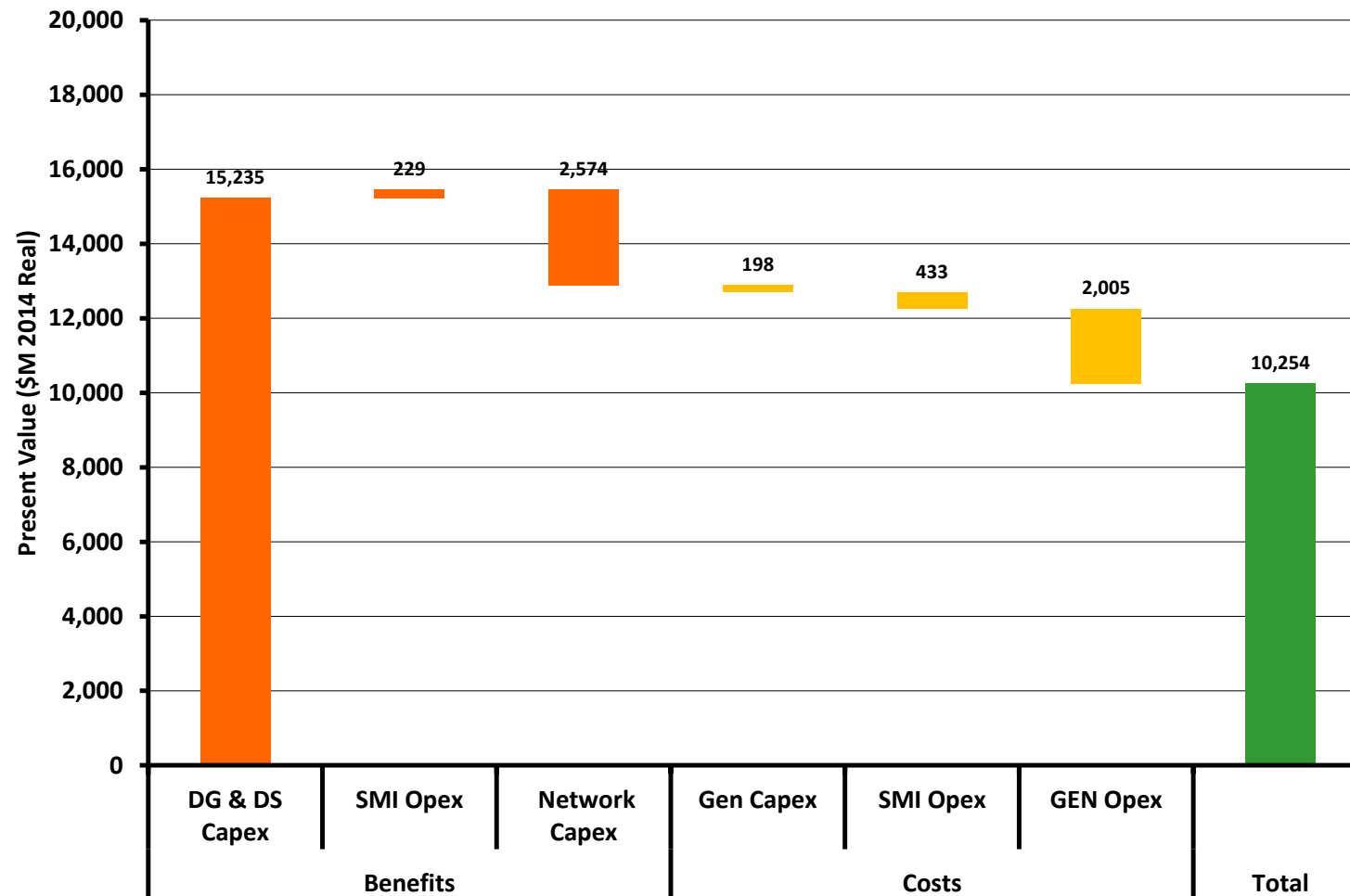
Electric Vehicle Smart Charging



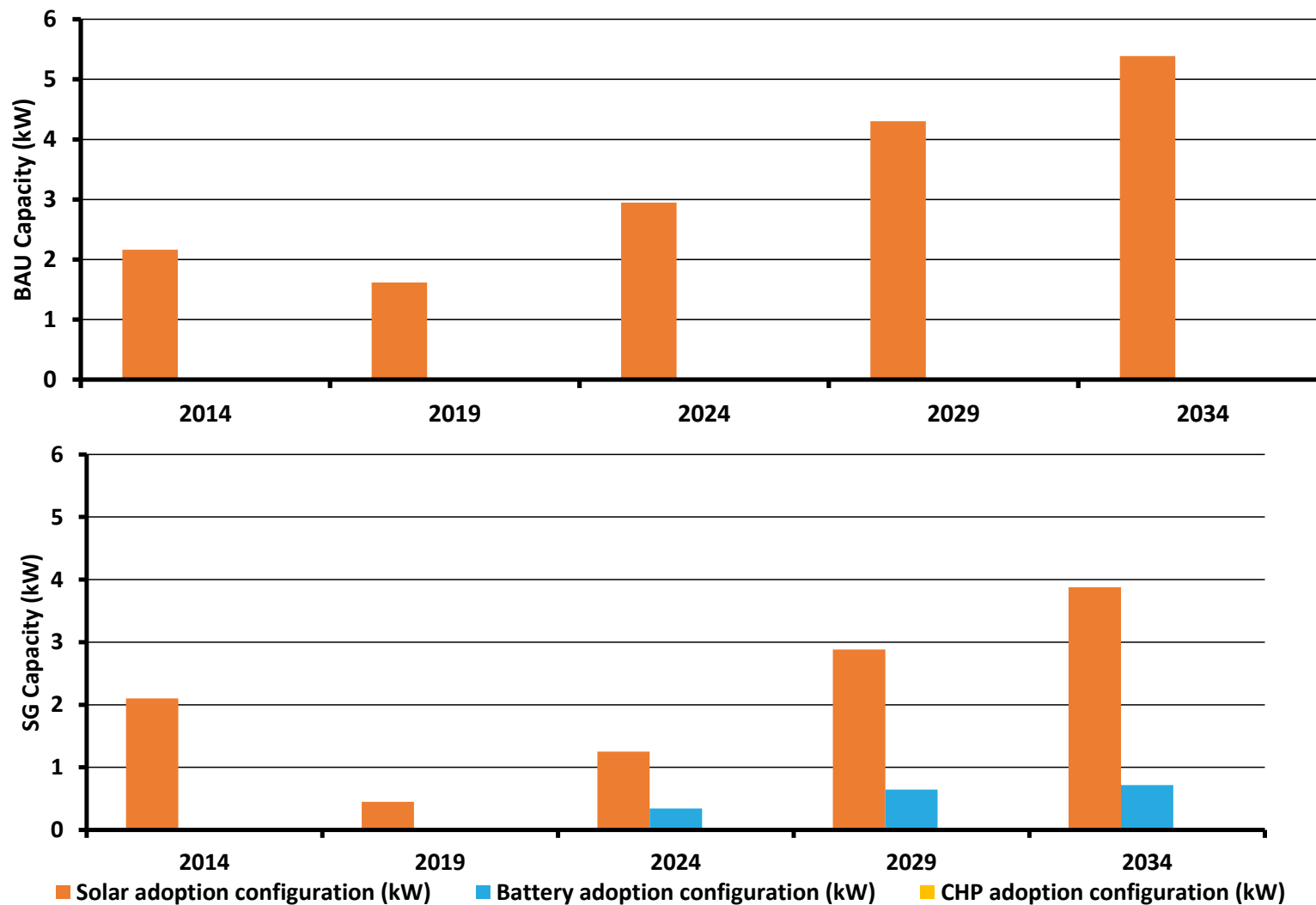
Contribution to National Net Benefit



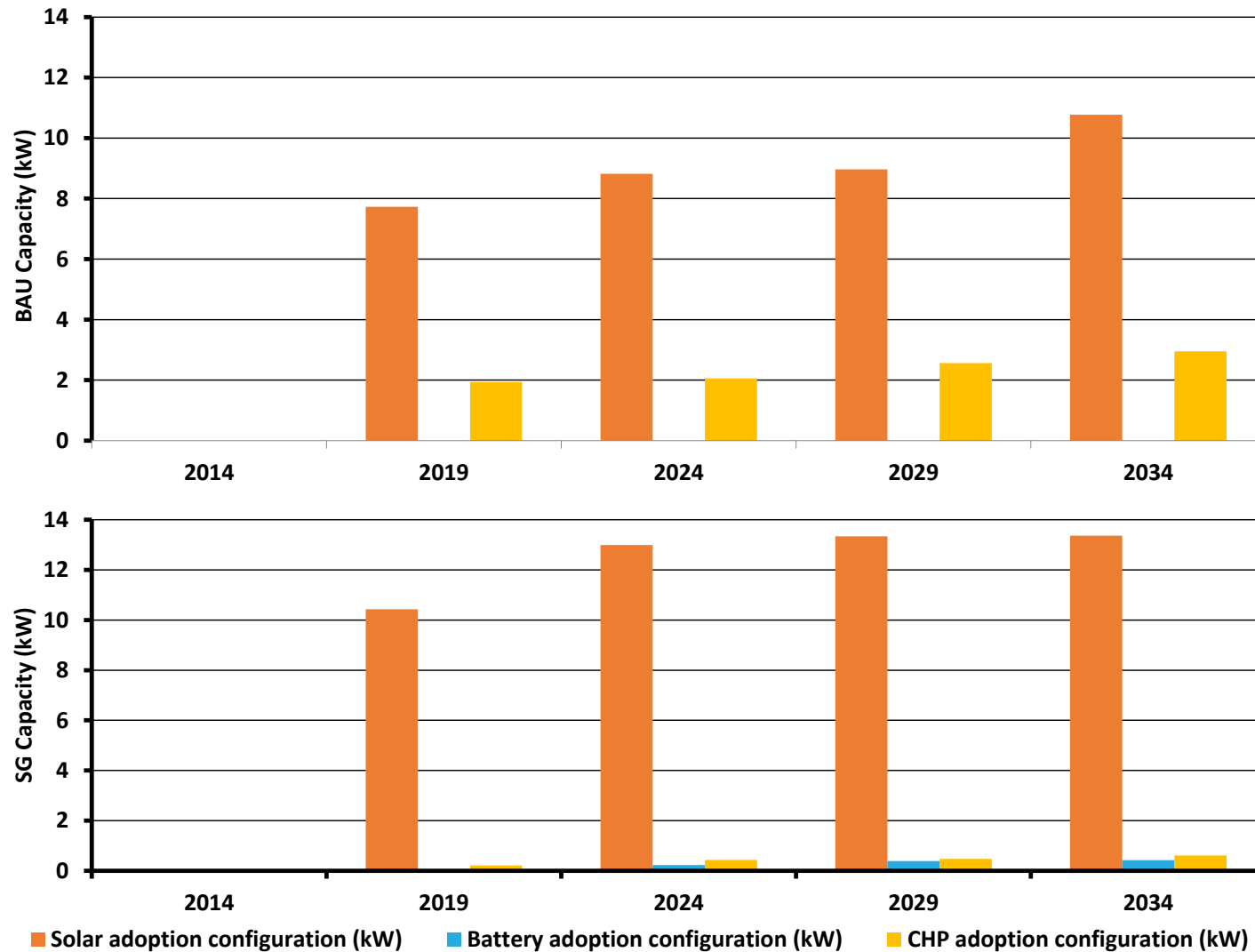
Distributed Generation and Storage



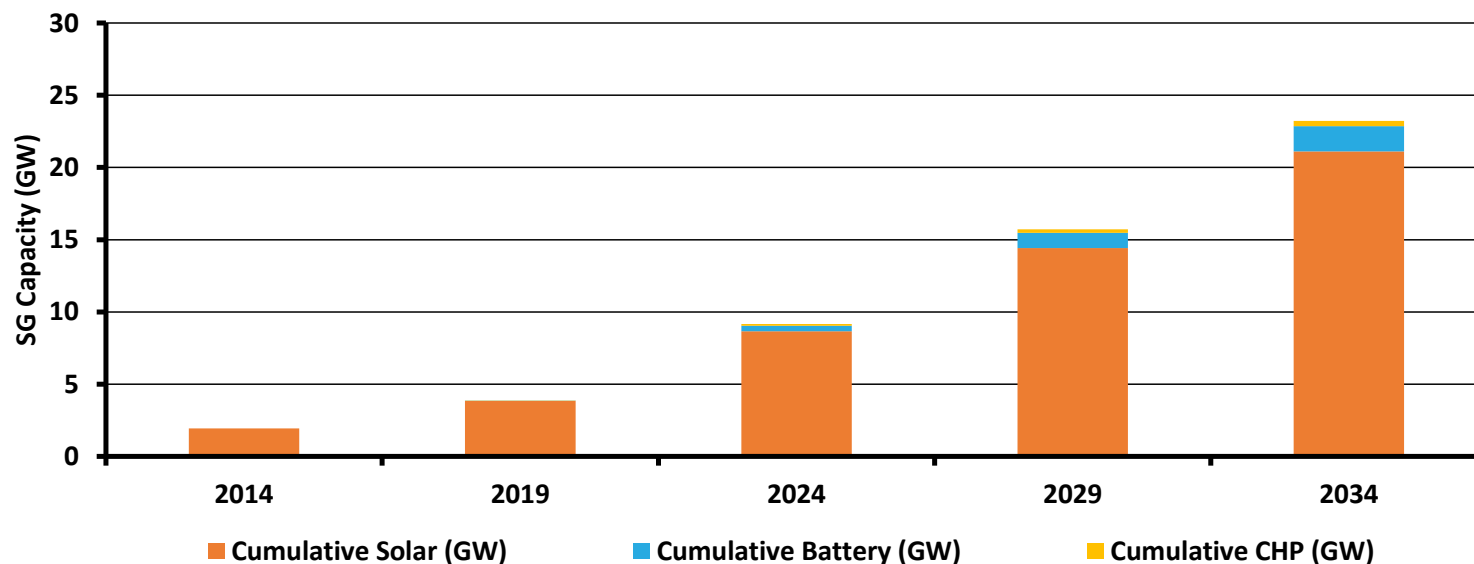
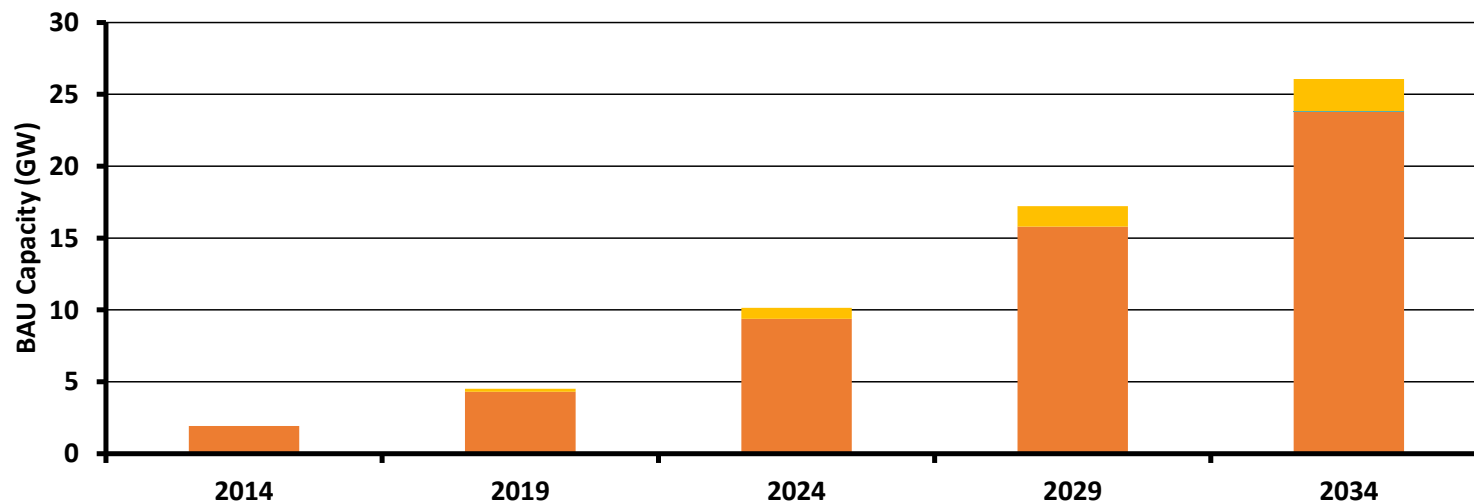
Average DGDS Configuration (Res)



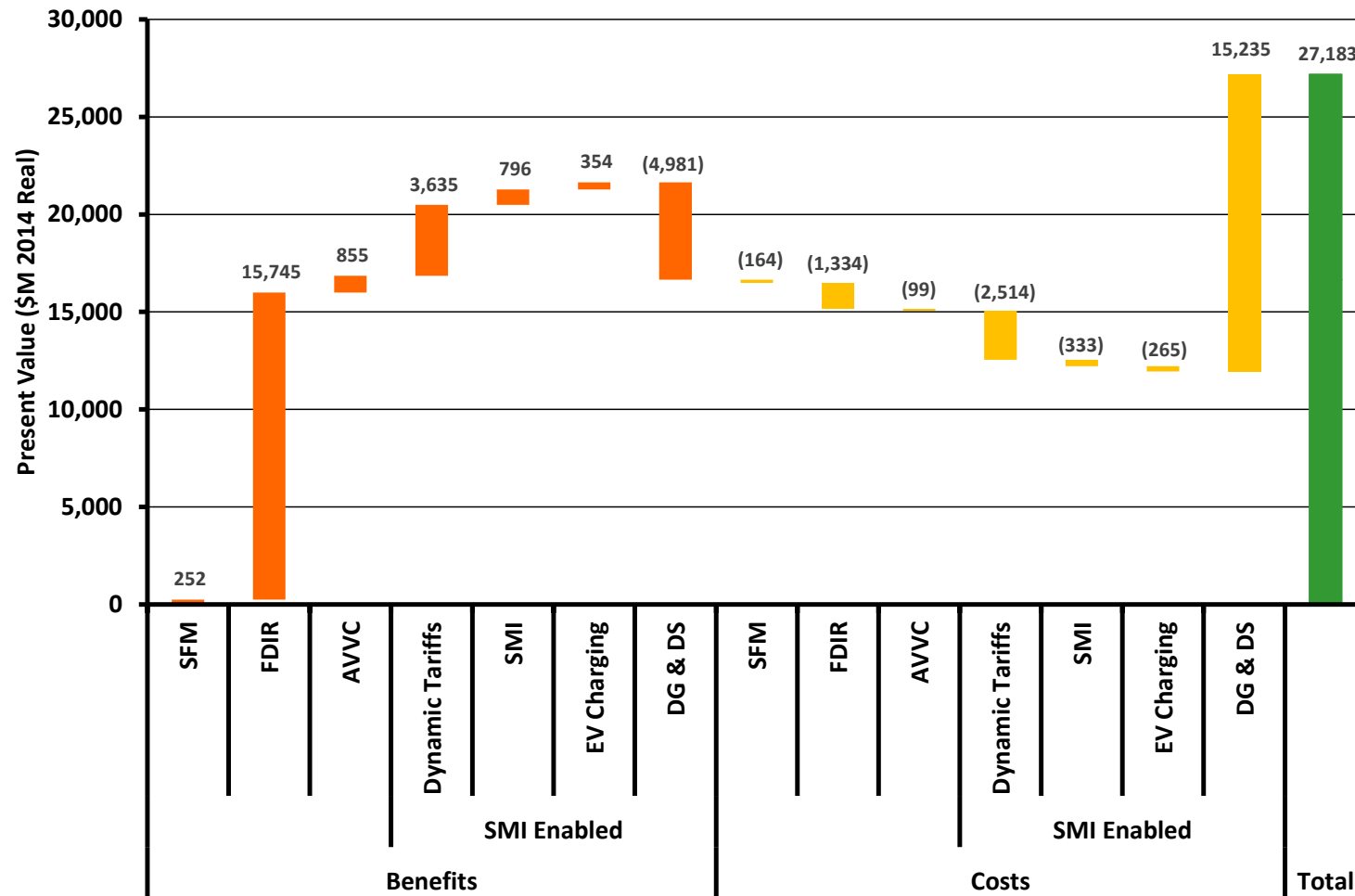
Average DGDS Configuration (Comm)



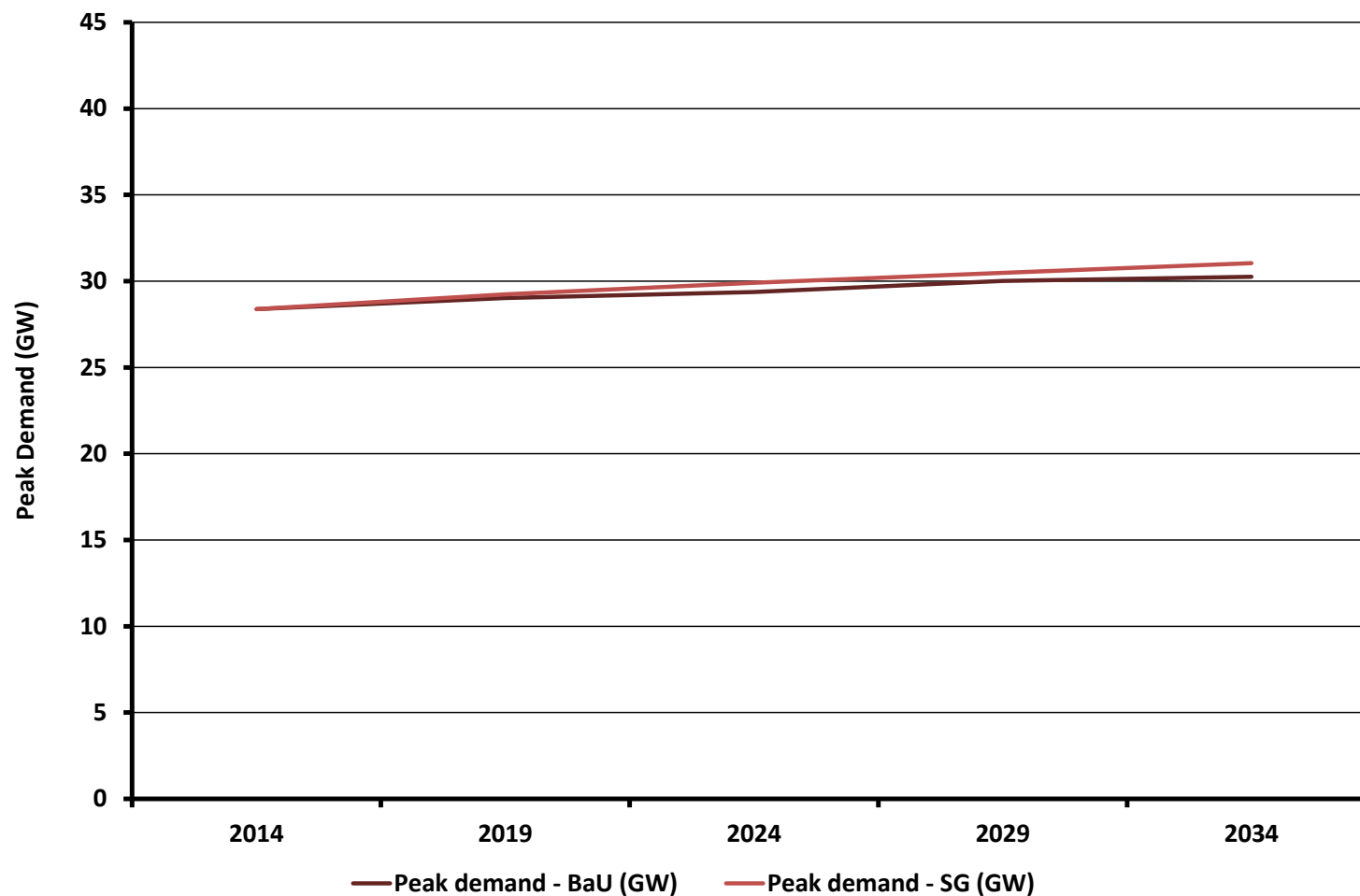
Total DGDS Capacity (NEM exc large ind)



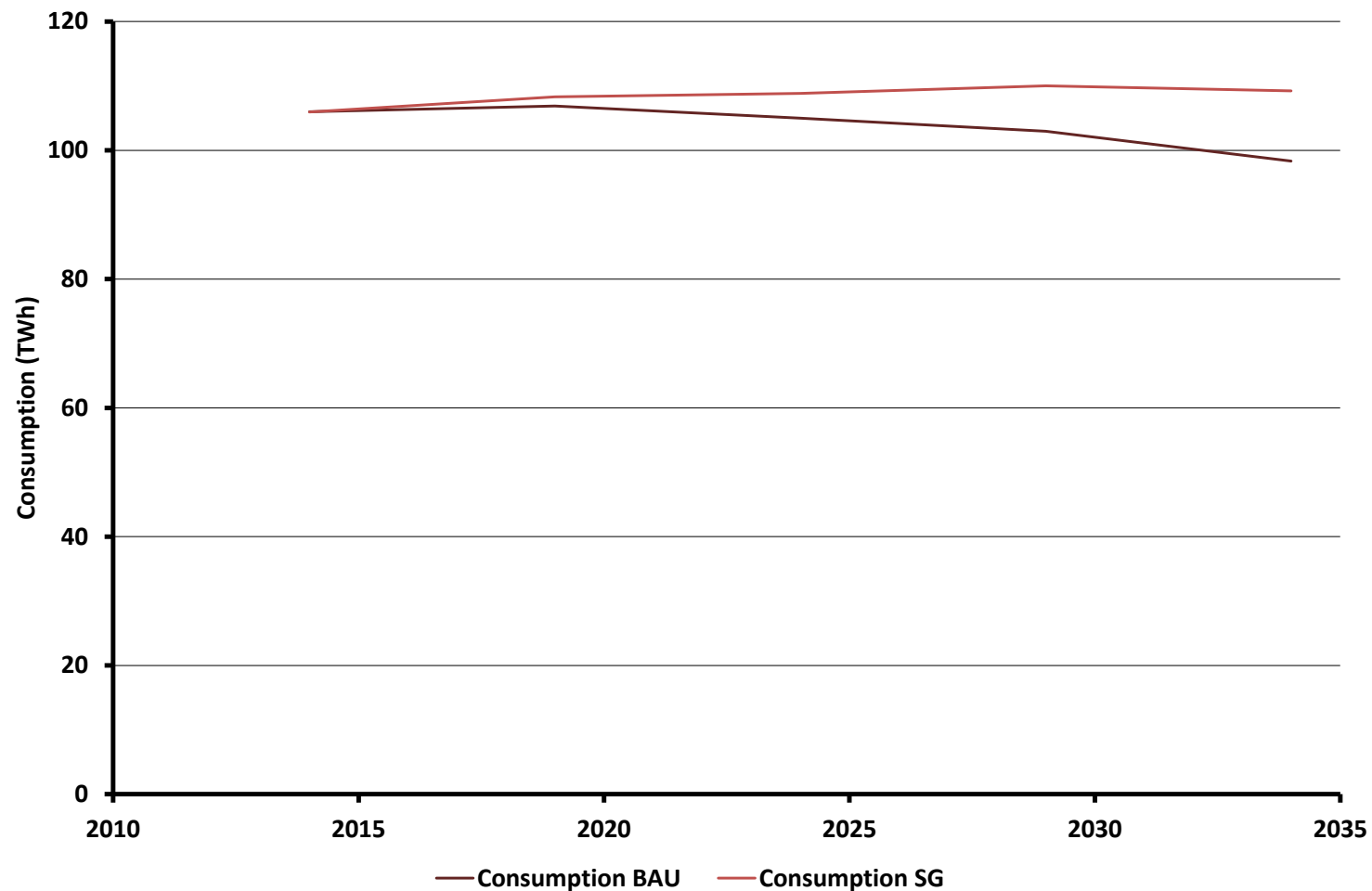
Contribution to National Net Benefit



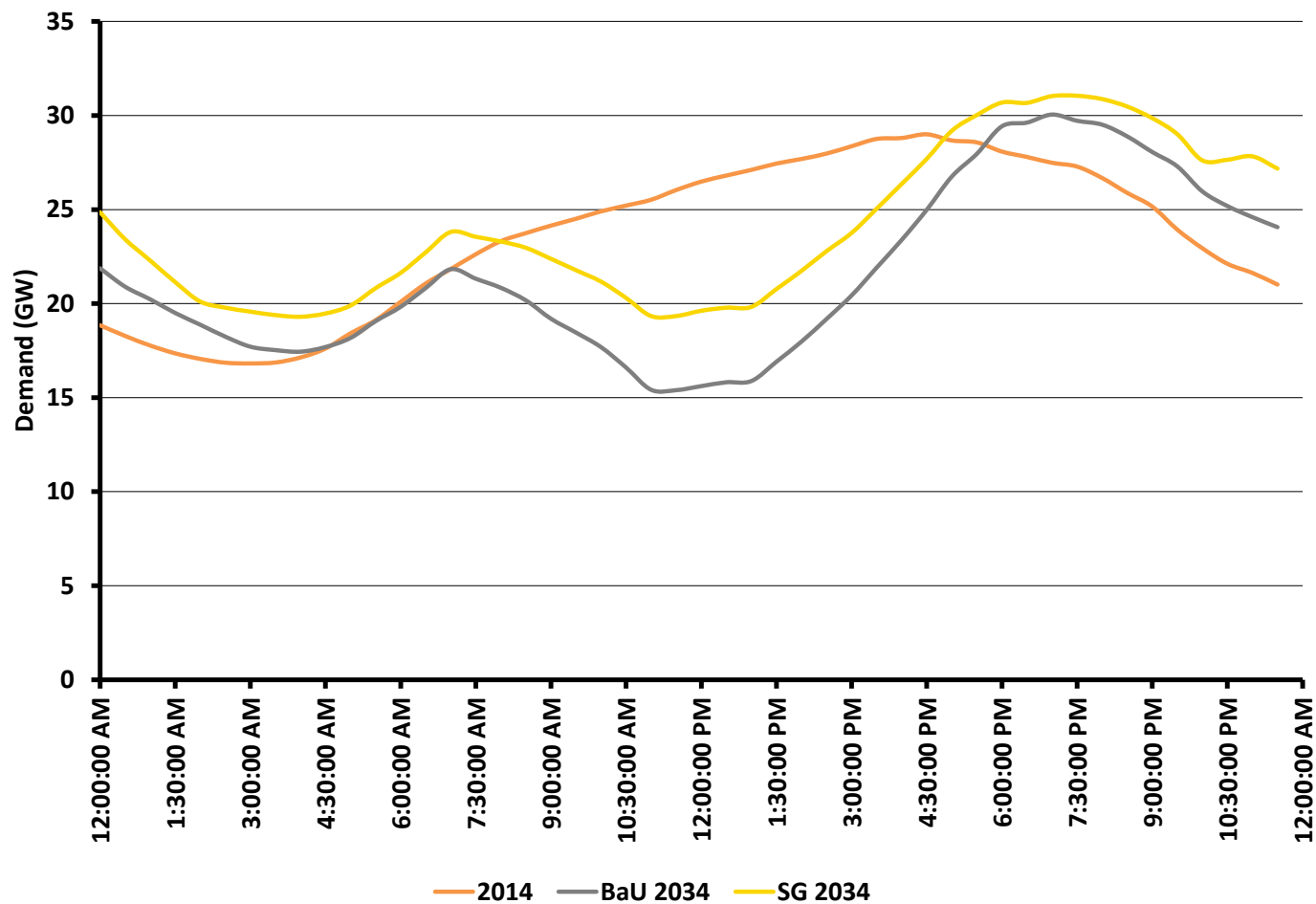
Change in Peak Demand



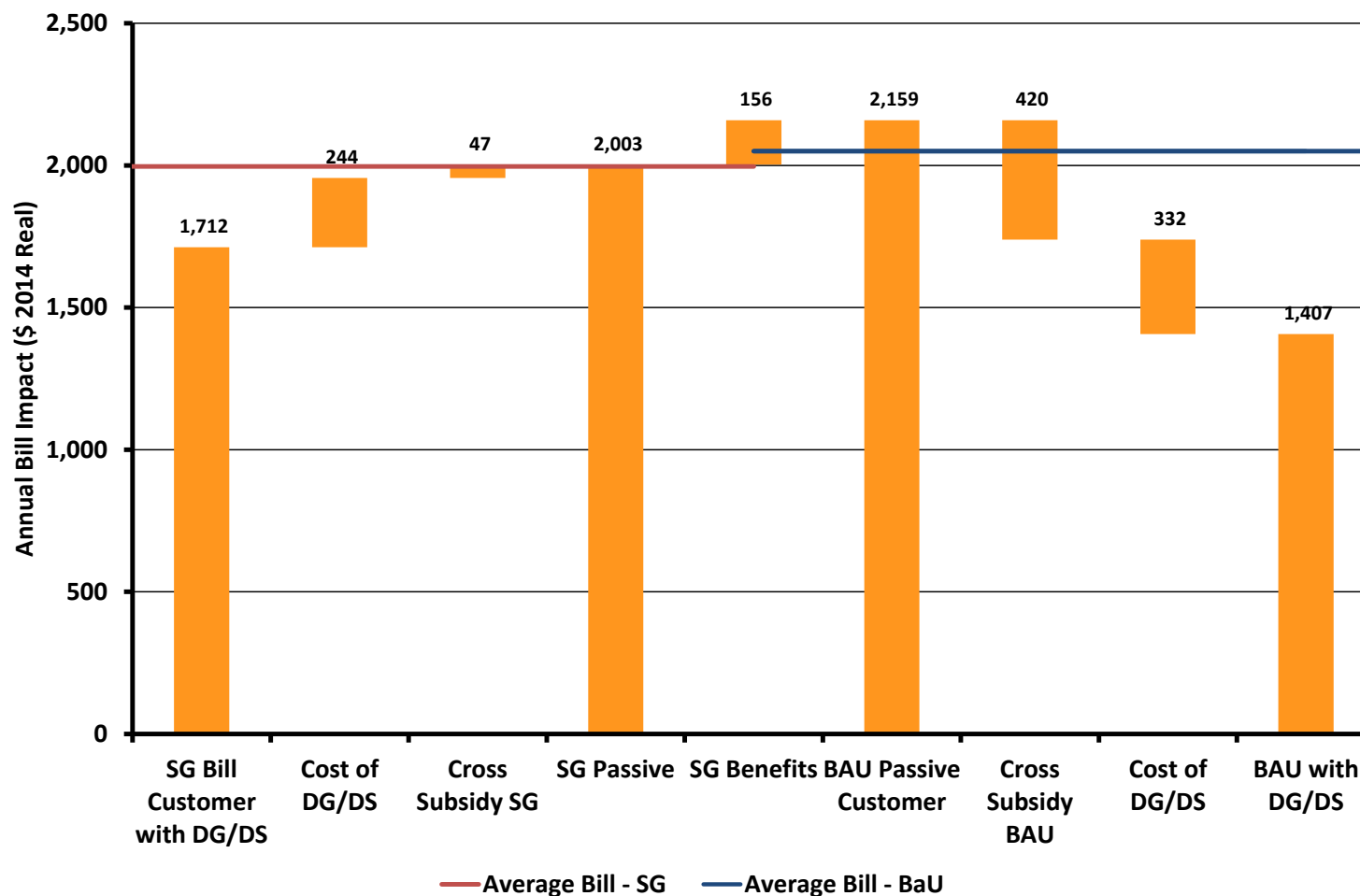
Change in Consumption



NEM Peak Day



Average Annual Bills in 2034 (Residential)



A background image featuring several white wind turbines of varying heights against a clear, light blue sky. A bright sun is visible in the upper right corner, creating a soft lens flare effect. The overall scene is clean and modern, representing renewable energy.

Post SGSC Developments

Post SGSC Developments (1/2)

- AEMC Metering Contestability Rule Change (Ongoing, Draft Determination due March 2015)
 - Likely to be retailer lead
 - Minimum functional spec likely to require smart metering
 - New and replacements likely to include smart meter functionality
 - Where this is a business case, retailers can roll out smart meters
- AEMC Distribution Network Pricing Draft Rule Determination (Aug 2014)
 - Requires tariffs to be based on LRMC
 - Networks already moving to capacity based tariffs (SA Power Networks, Energex)



Post SGSC Developments (2/2)

- AEMC Distribution Reliability Measures (September 2014)
 - AER to develop reliability guidelines
 - MAIFI increasing from 1 minute to 3 minutes
- AEMO Value Customer Reliability (October 2014)
 - Residential values have not changed substantially since 2007/08
 - Commercial values notably higher



Energeia Subsequent Analysis for ENA

- Modelling of DGDS uptake and impact on network prices for
 - Declining Block Tariffs
 - Inclining Block Tariffs
 - Maximum Demand Tariffs
 - Seasonal Time of Use
- Understanding the tariff design process and impact of:
 - Setting peak charge to be cost reflective
 - Setting residual charges to so as not to distort
 - Metering requirements



Energeia Subsequent Analysis for ENA

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 - Maximum Demand Tariffs
 - Seasonal Time of Use
- Understanding the tariff design process and impact of:
 - Setting peak charge to be cost reflective
 - Setting residual charges to so as not to distort price signals
 - Metering requirements
- Sneak preview

Thank You

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