



No transition without transmission:
innovation needed for the electricity grid

Have you ever examined your electricity bill?

Total Charges for Electricity

Supplier (DIRECT ENERGY CITY OF SOMERVILLE)

Meter 7131539

| | | |
|----------------------------|------------------|---------|
| Generation Service Charge | 311 kWh X .10519 | \$32.71 |
| Subtotal Supplier Services | | \$32.71 |

Delivery

(Rate A1 R1 RESIDENTIAL) (Prorated)

Meter 7131539

| | | |
|----------------------------|-------------------|---------|
| Customer Charge | | \$7.00 |
| Distribution Charge | 311 kWh X .07048 | \$21.92 |
| Transition Charge | 311 kWh X -.00158 | -\$0.49 |
| Transmission Charge | 311 kWh X .04132 | \$12.85 |
| Revenue Decoupling Charge | 311 kWh X .00277 | \$0.86 |
| Distributed Solar Charge | 311 kWh X .00270 | \$0.84 |
| Renewable Energy Charge | 311 kWh X .00051 | \$0.16 |
| Energy Efficiency | 311 kWh X .01714 | \$5.33 |
| Subtotal Delivery Services | | \$48.47 |

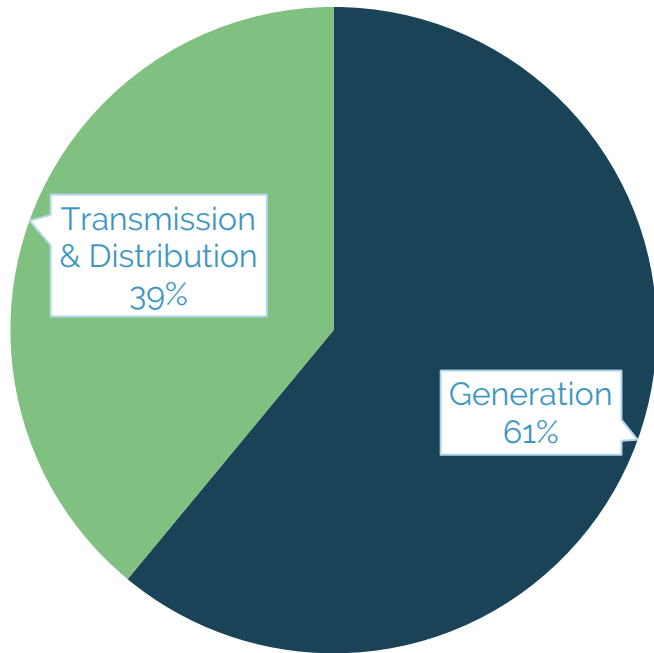
Total Cost of Electricity **\$81.18**

Total Current Charges **\$81.18**

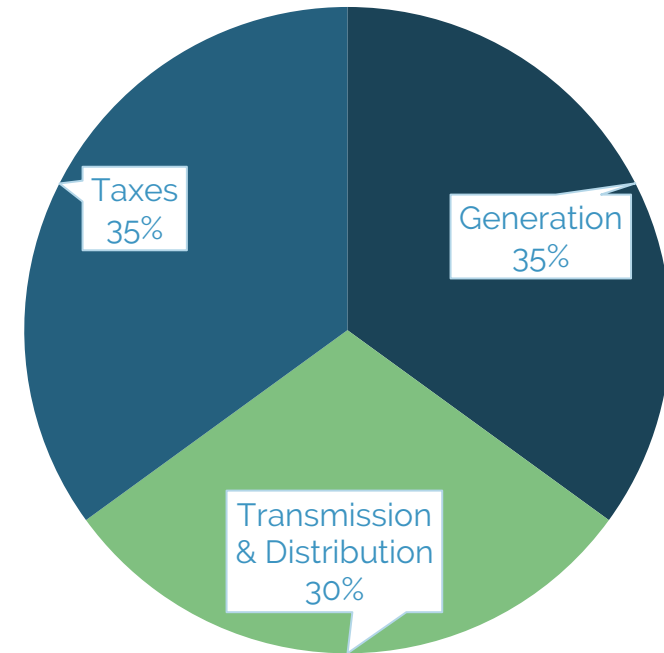


We pay a surprising amount for transmission and distribution!

Average USA bill



Average European bill



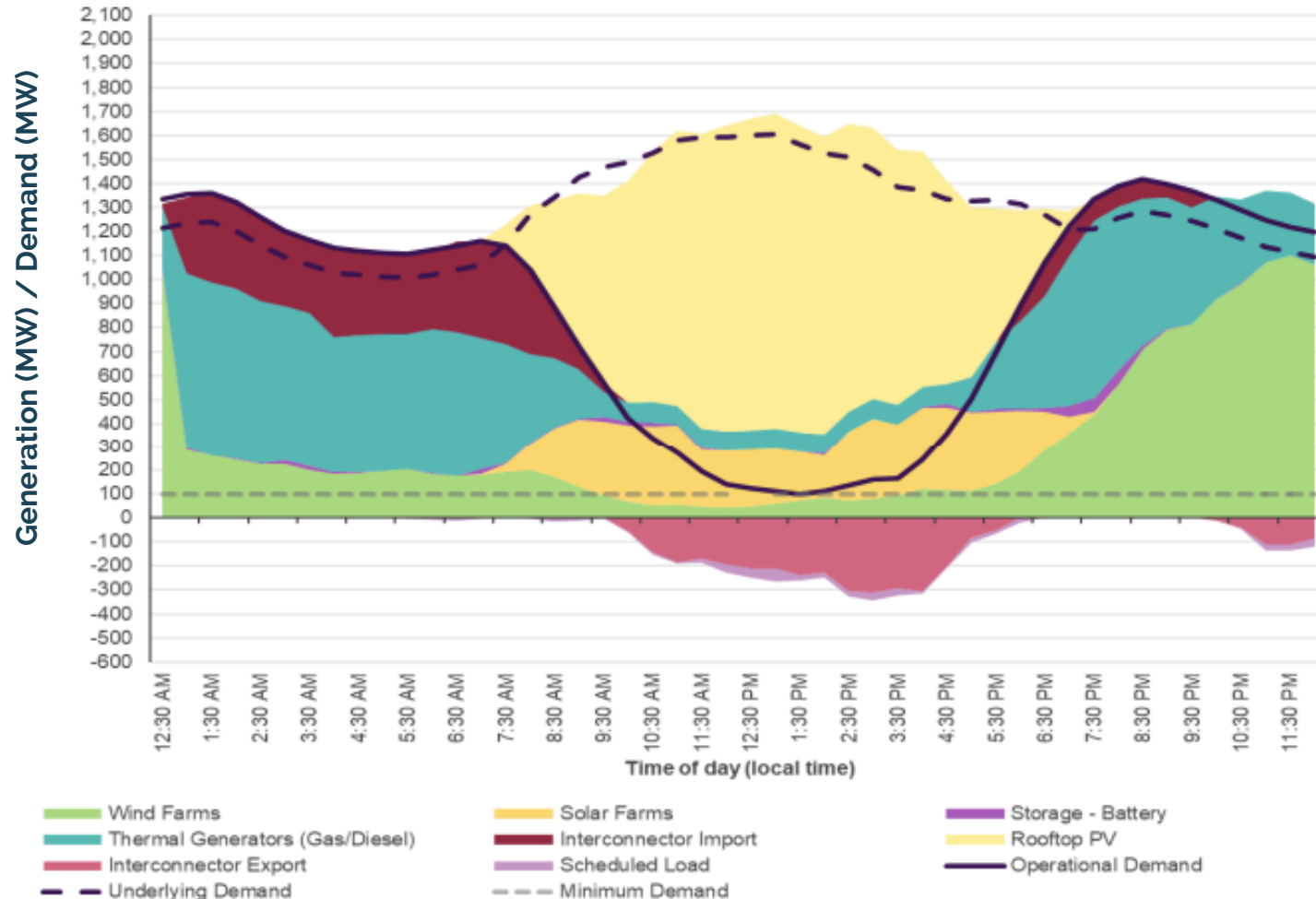
An aerial photograph of a suburban neighborhood with numerous houses. Many of the houses have solar panels installed on their roofs. The houses are mostly two-story, with varying roof colors and styles. The background shows more trees and a clear sky.

Is energy independence with
rooftop solar a solution?

.... or is it too much of a good thing?



South Australia exports solar to its neighbors at noon



**1 in 3 homes in
Australia have
rooftop solar**





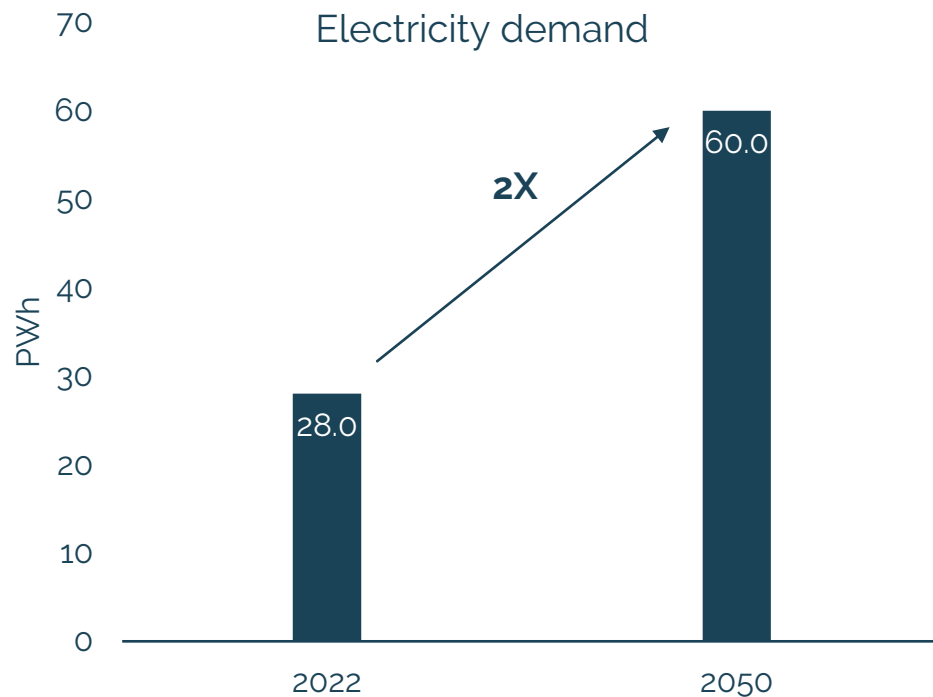
**Despite excess solar –
→ 80,000 people had no
power during a storm**

**400MW of rooftop
→ solar was shut off
to prevent “solar-
spills”**



Electricity demand is expected to double from 2022 to 2050...

...which is the equivalent of adding another USA and EU at their current rates.



Meeting this growing demand requires a two-pronged approach

01

Building more generation, storage transmission and distribution capacity

\$4.8T annually to support net zero goals; of which **\$600B** needs to be invested annually in power grids by 2030

This is influenced mostly through policy and capital from large infrastructure investors



Maximizing use of existing infrastructure

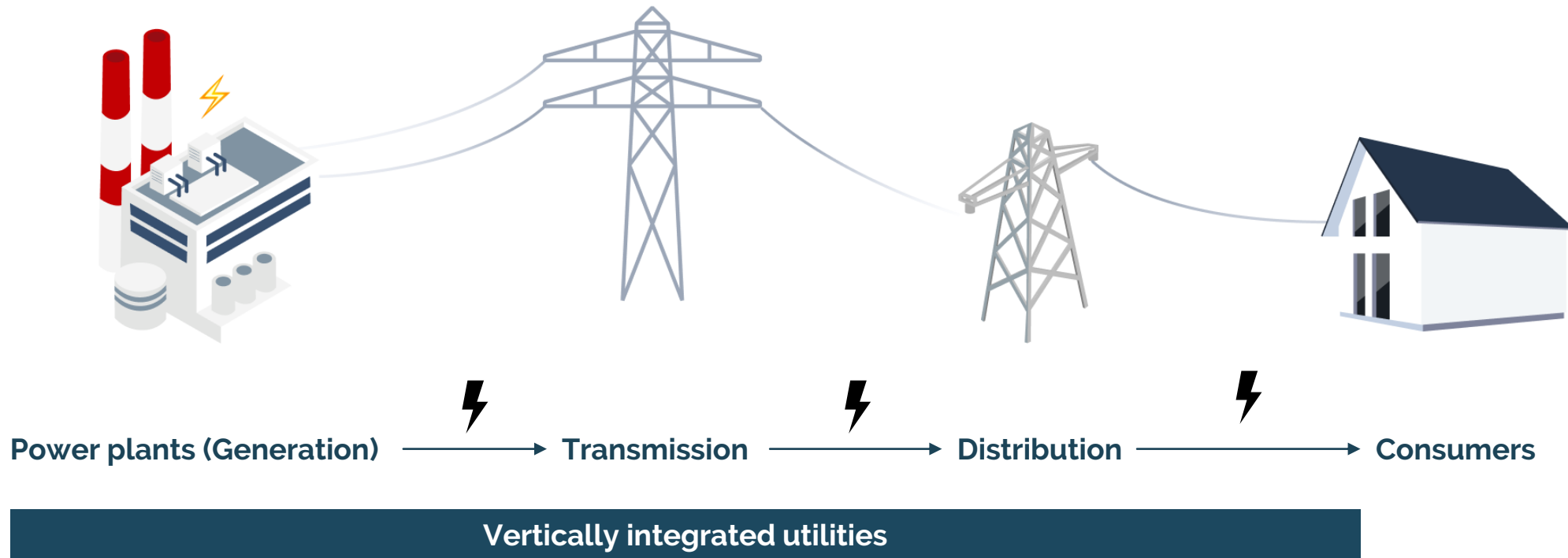
Investing in grid resilience through **prosumer**-led grid optimization and integration technologies

This is where innovation and Venture Capital will play a role

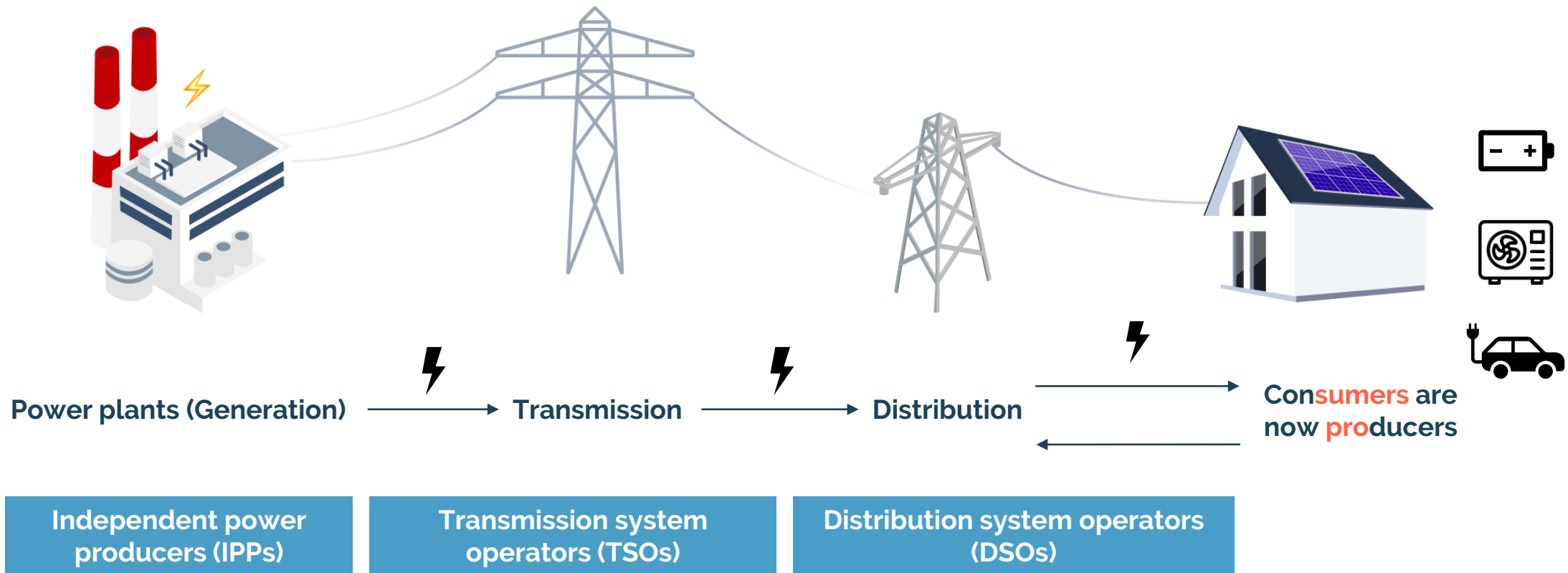
02



Traditional electricity markets were designed to be unidirectional



Electricity markets are opening up to competition – creating **prosumers**



From a few large power plants to millions of tiny power houses



An aerial photograph of a city, likely Detroit, Michigan, showing a dense urban landscape with numerous buildings and streets. In the background, several industrial smokestacks are visible, emitting plumes of white smoke that rise into the sky. The city is situated near a large body of water, which is partially visible on the right side of the image. The overall scene is captured in a slightly desaturated, blue-toned aesthetic.

**Virtual power plants could save the
US \$13B annually in costly grid
upgrades and avoided fuel costs**

Source: US DoE – Pathways to Commercial Liftoff: Virtual Power Plants –
September 2023

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Prosumerism presents a fantastic opportunity

- To stagger or defer costly grid upgrades
- To create a more stable and reliable grid
- To promote a cleaner, more affordable energy future!



