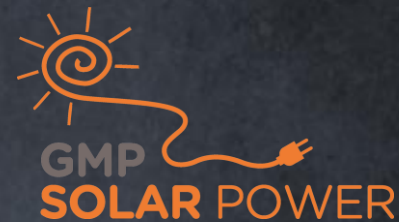




Green Mountain Power
Josh Castonguay

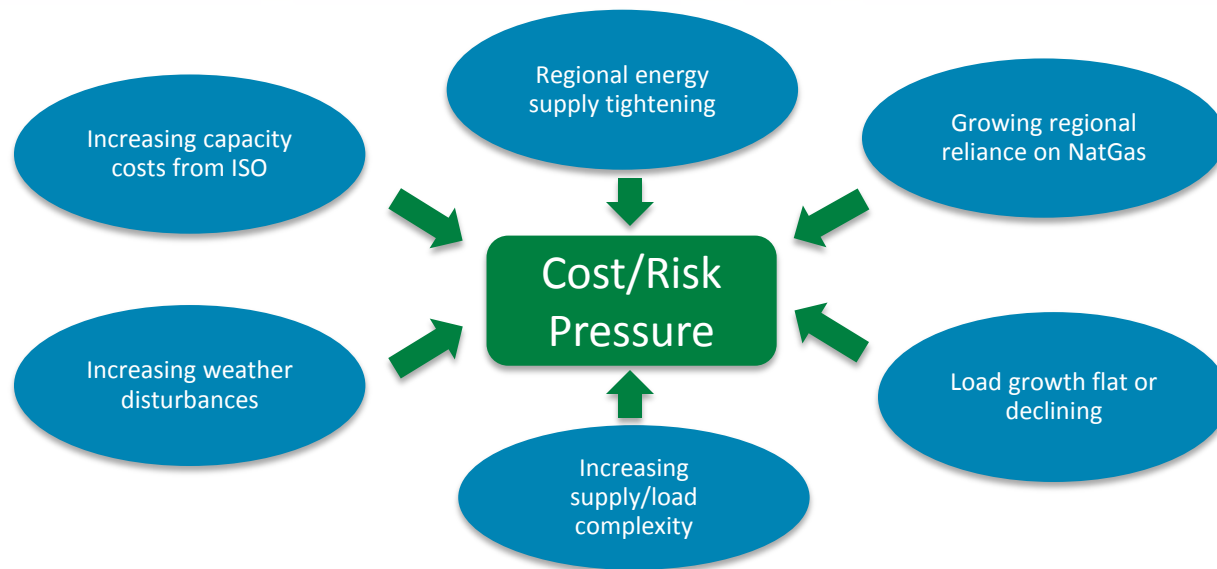
Transforming the Grid VT House Natural Resource Committee



January 15, 2016



Current Challenges/Opportunities



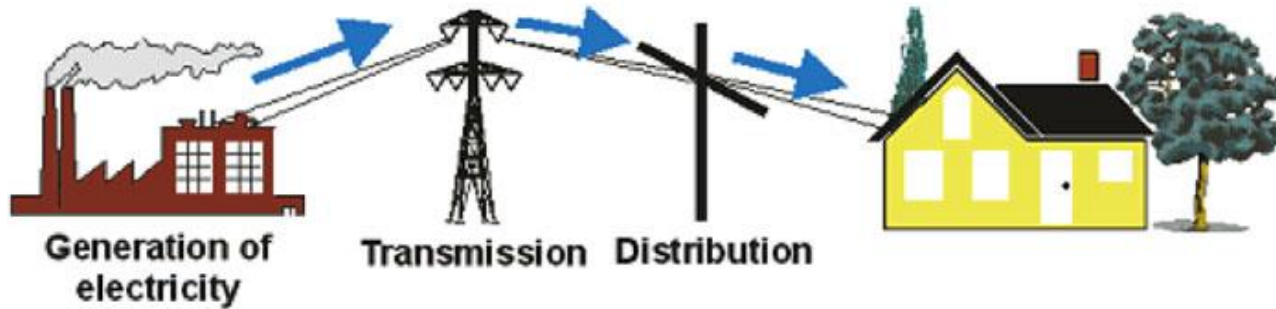
Technology creates an opportunity to embrace progress and transition to a new business model

So what do we do?

Three Strategic Imperatives:

- 1) *Change the distribution grid model*
- 2) *Customer value*
- 3) *Increase reliance on local resources*

Today



Today:

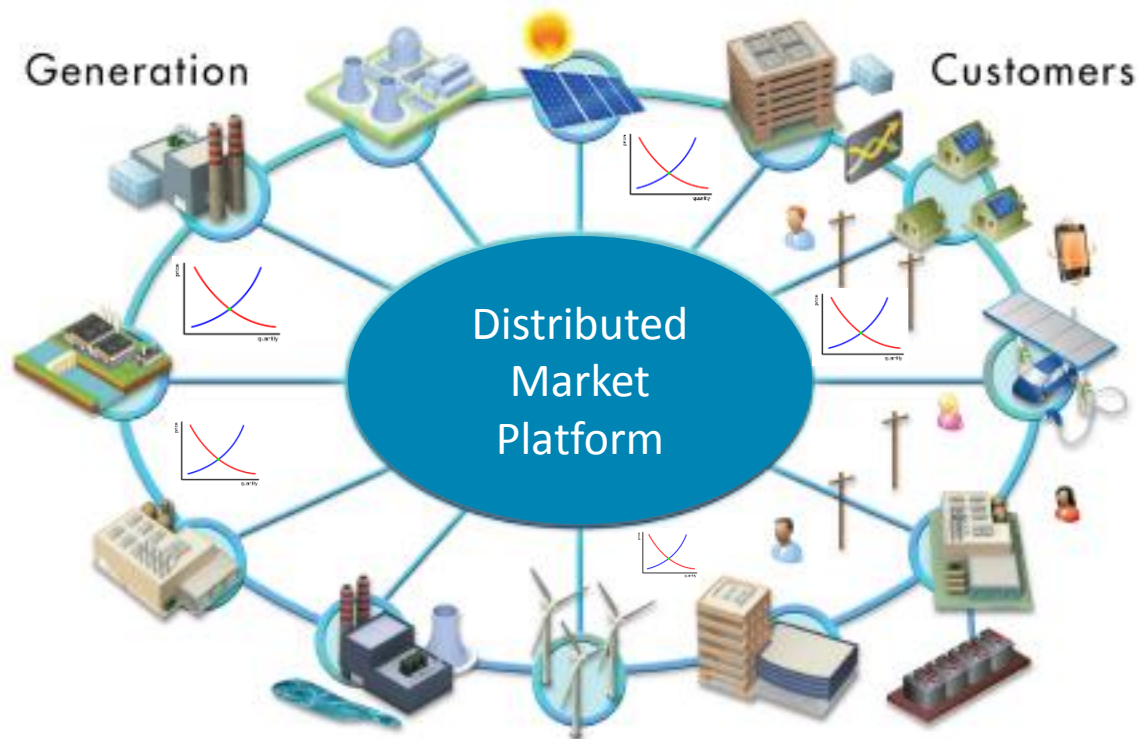
- Electricity moves in one direction over long distances, leading to losses and immense infrastructure requirements
- System built to accommodate demand = Inefficient

When a customer turns on a kW of load, the bulk grid must supply that additional kW – which could result in nearly 2 kW being turned up to meet the need due to inefficiencies and losses

Tomorrow

Guiding Philosophy: Shift from relying on the bulk power grid to a grid that relies on local energy resources.

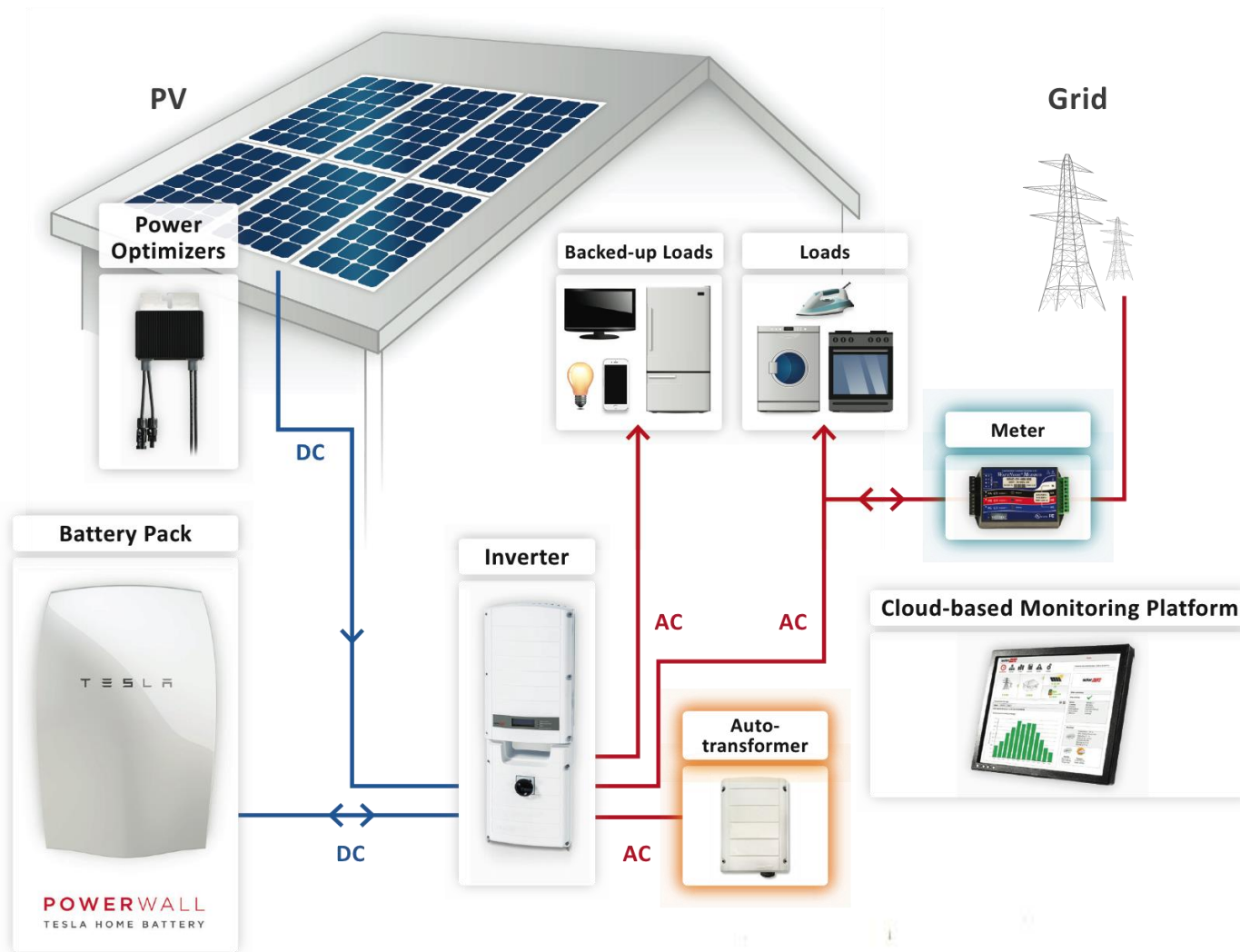
- Create value from energy supply and demand assets at customer's home and business
- Leverage advanced software to automate grid management for greater resilience and efficiency
- Grid investments focus on maximizing local values and resiliency



How do we make the grid transition?

- Distributed Energy Resources (DER's) are critical to advancing us out of the 100 year old grid operating paradigm
- A few key values of DER's:
 - Peak load management
 - System loss reductions
 - Power quality and reliability
 - Grid resiliency
 - Renewable integration
 - Ancillary grid services (i.e. frequency regulation)
 - And.....

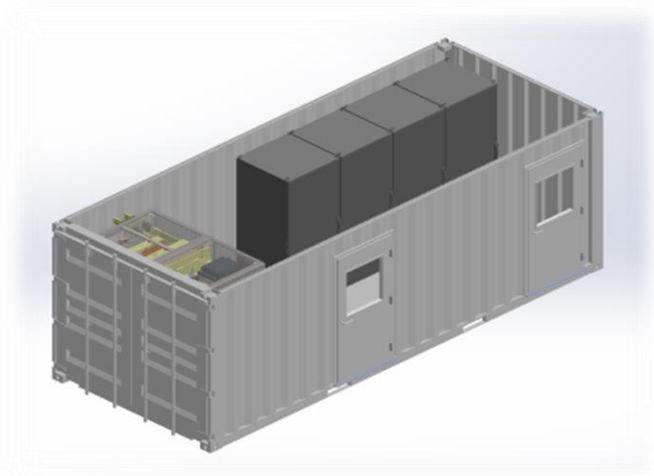
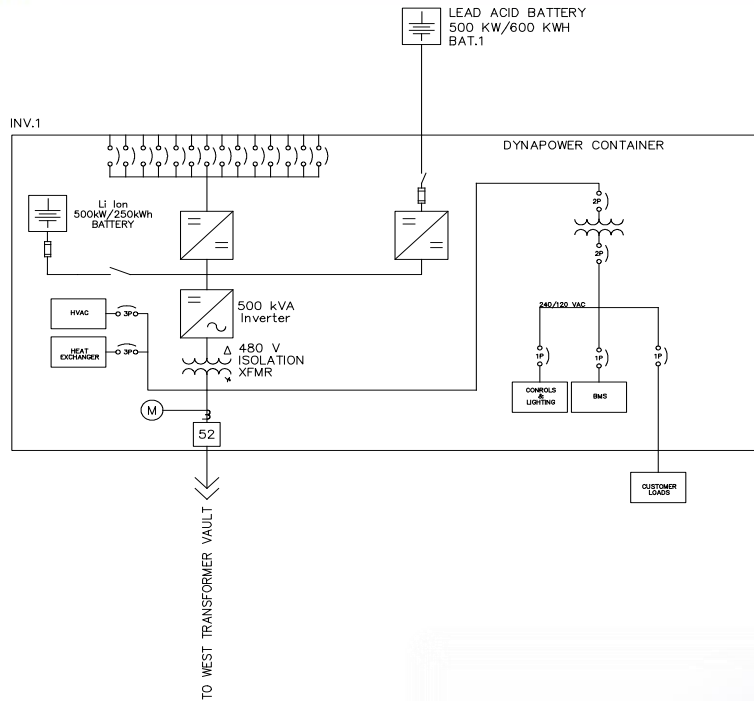
Home Energy Storage



Grid Energy Storage – Stafford Hill

Stafford Hill Solar+Battery

- 2.5MW Fixed Solar on Landfill Cap
- 2MW/1MWH Lithium Ion Batteries
- 2MW/2.4MWH Lead Acid Batteries
- 4 – 500KW VT Made Multiport Inverters



Bringing it all together – Rutland Microgrid Project



Stafford Hill

- ~4 MW peak load
- 3.6MW solar
- 3.4 MWH battery storage
- 150 controllable water heaters
- Home energy storage
- Micro-Grid controls

