

The Itron logo is located in the top left corner. It consists of the word "Itron" in a white, sans-serif font, with a small yellow and red graphic element above the letter 'o'. The logo is set against a red rectangular background.

Itron

The background of the slide is a wide-angle photograph of a tropical island. The foreground shows clear, turquoise water with gentle ripples. In the middle ground, a sandy beach leads to a dense line of green tropical vegetation, including many palm trees. A small, dark-roofed building is partially visible through the trees on the left side of the island. The sky is a vibrant blue with scattered white clouds.

Implementing DRRI in Pacific Island Nations

PPA CONFERENCE – AUG 2018

RENEWABLE INTEGRATION

RENEWABLES
GENERATION HAS THE
CAPABILITY TO
EMPOWER SMALL
“MICRO” GRIDS WITH
SUSTAINABLE POWER

LESS DIESEL
GENERATION

UNLOCKING THE
POWER REQUIRES
DEMAND TO BE
BALANCED AGAINST
GENERATION

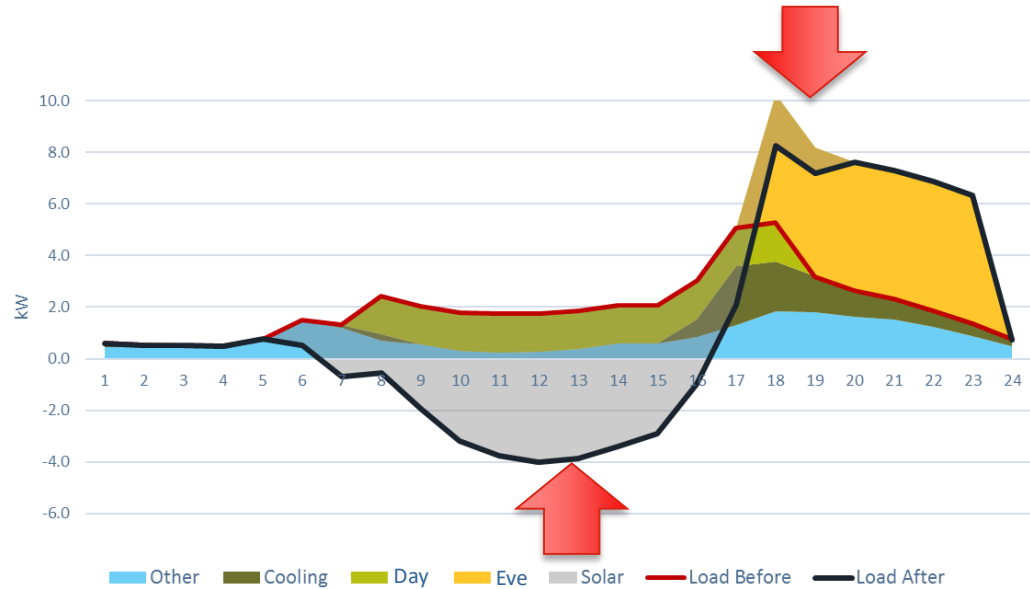
- Diesel reliance is expensive, bad for the environment, price fluctuates and limits growth in Island nations. Supplanting diesel by renewables can reduce generation costs by up to 40%.
- Demand & Requirements for economic growth require enhanced and more reliable supply;
- Renewables supply the increased capacity though at specific times within the day
- Consumer demand may not necessarily match the time at which the power is available
 - Excess power can be just as damaging as a lack of power
 - Loss in renewable output (clouds / wind drop) needs to be in-filled

THE TWO SIDES OF RENEWABLES

THE TRADITIONAL ENERGY PROFILE IS CHANGING

- MODERN LIFESTYLE ADDS DEMAND
- SOLAR INTRODUCED TO ADD CAPACITY
- IMBALANCE CREATED

A NEW PROBLEM NOW NEEDS TO BE SOLVED



- Unconstrained generation now regarded as threat in many countries

THE ANSWERS ?

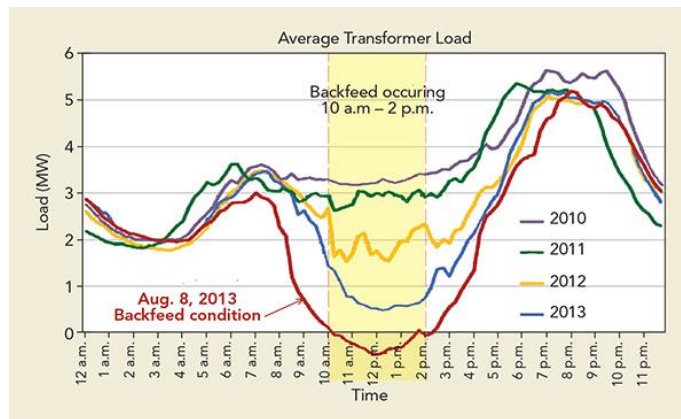
BATTERY STORAGE

MIGRATING CUSTOMER DEMAND TO MATCH GENERATION

- CONTROL FOR SHORT TERM PLANNING

- EDUCATION AND TARIFFS FOR LONGER TERM

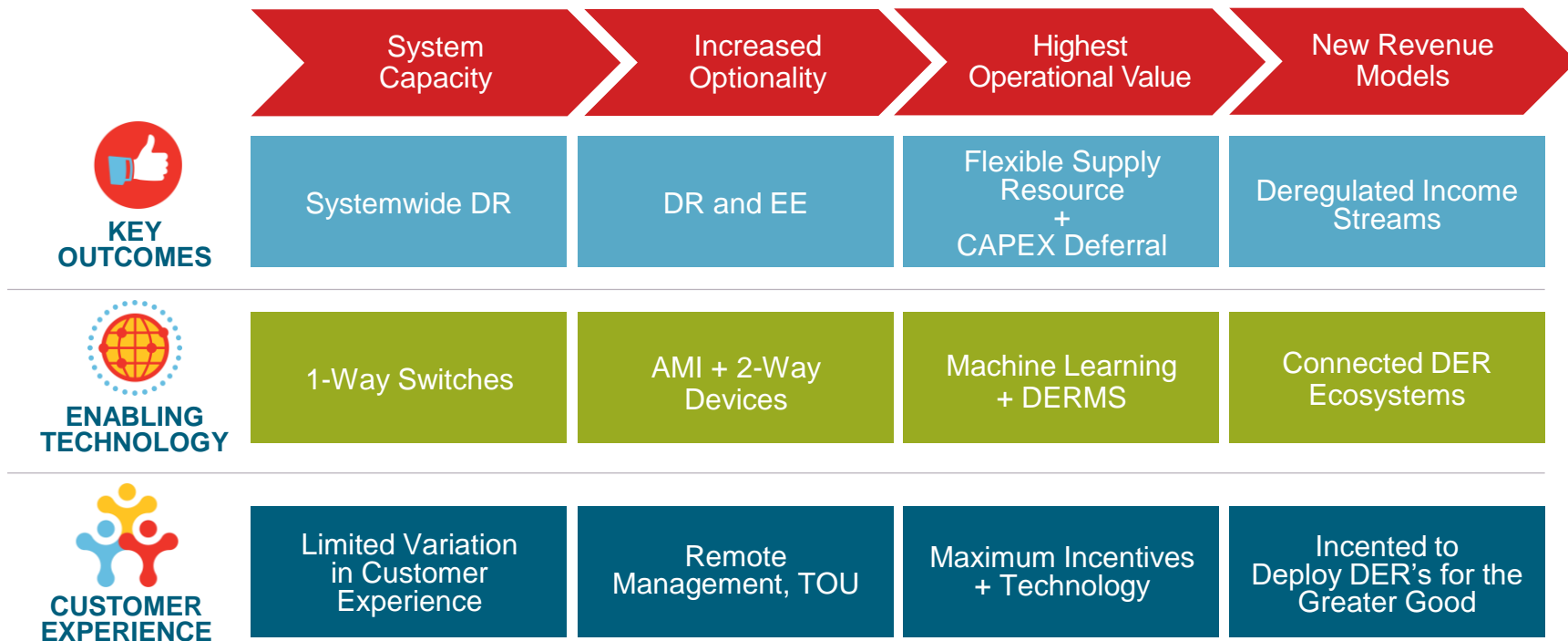
Intermittent generation



Can result in unexpected and significant changes in loads at feeders

- Large Batteries form front-line fast response for localised drops;
- Smaller batteries used to migrate consumption patterns making power profiles easier to manage
- Demand Management can aid both

EVOLUTION OF DEMAND MANAGEMENT



SMART HOME STUDY

Enabling more comprehensive use of Renewable power



THE GOALS OF THE SMART HOME STUDY

- Demonstrate DER orchestration and optimization
- But keep the customers happy!
- Investigate how different tariffs can drive automated response
- Assess potential for technology-enabled improvements to grid reliability
- Assess commercialization potential

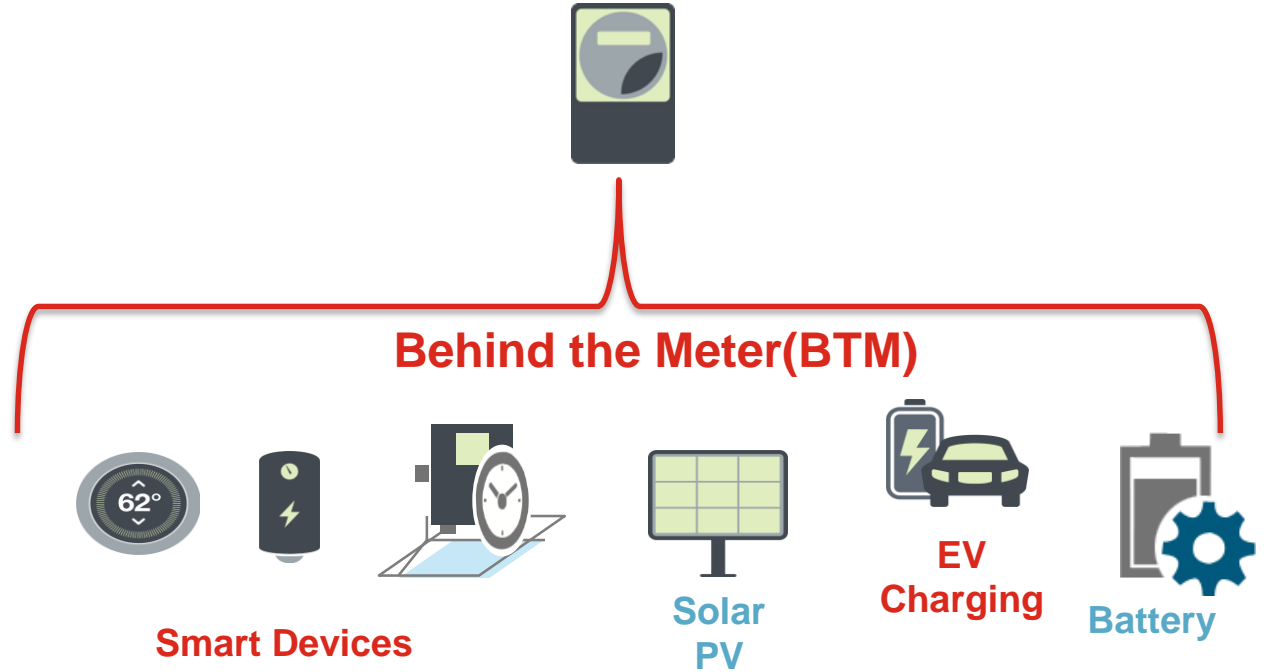


GROWING AMOUNT OF BTM

Behind the Meter (BTM) Distributed Energy Resources (DERs)

NUMEROUS
CONTROLLABLE
ASSETS ARE
AVAILABLE TO
OPTIMISE THE DEMAND
PROFILE

INVESTIGATE
INDIVIDUAL
STRATEGIES
DEPENDANT UPON
ASSETS



DISTRIBUTION OF TECHNOLOGIES

For each Consumption Asset, look at DER Control Strategy

AC	PV	EV	Storage	Method of Control
✗	✗	✗	✗	Shift and flatten
✗	✗	✗		Reduce AC during peak, shift EV
✗	✗		✗	Reduce AC during peak, load shift with storage
✗	✗			Reduce AC during peak
✗		✗	✗	Shift EV, reduce AC during peak, storage to flatten
✗		✗		Shift EV, reduce AC during peak

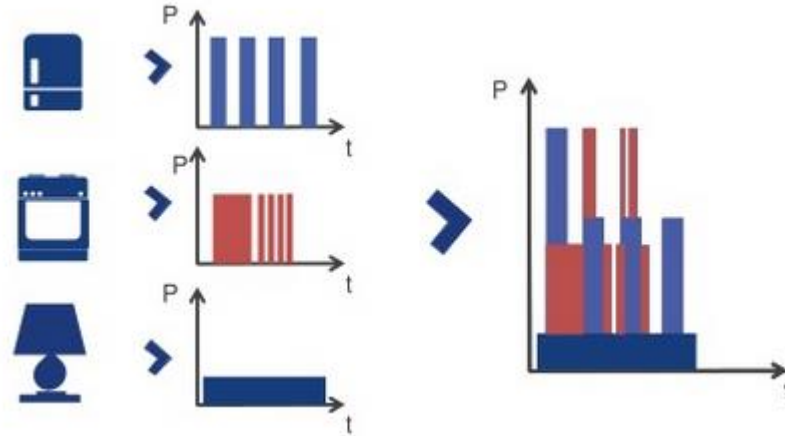
LOAD MONITORING

Knowledge on Consumer's power usage patterns critical to success

FORECASTING AND
STRATEGY NEEDS
ACCURATE CONSUMER
DEMAND

SMART METERING
TELLS THE "NET"

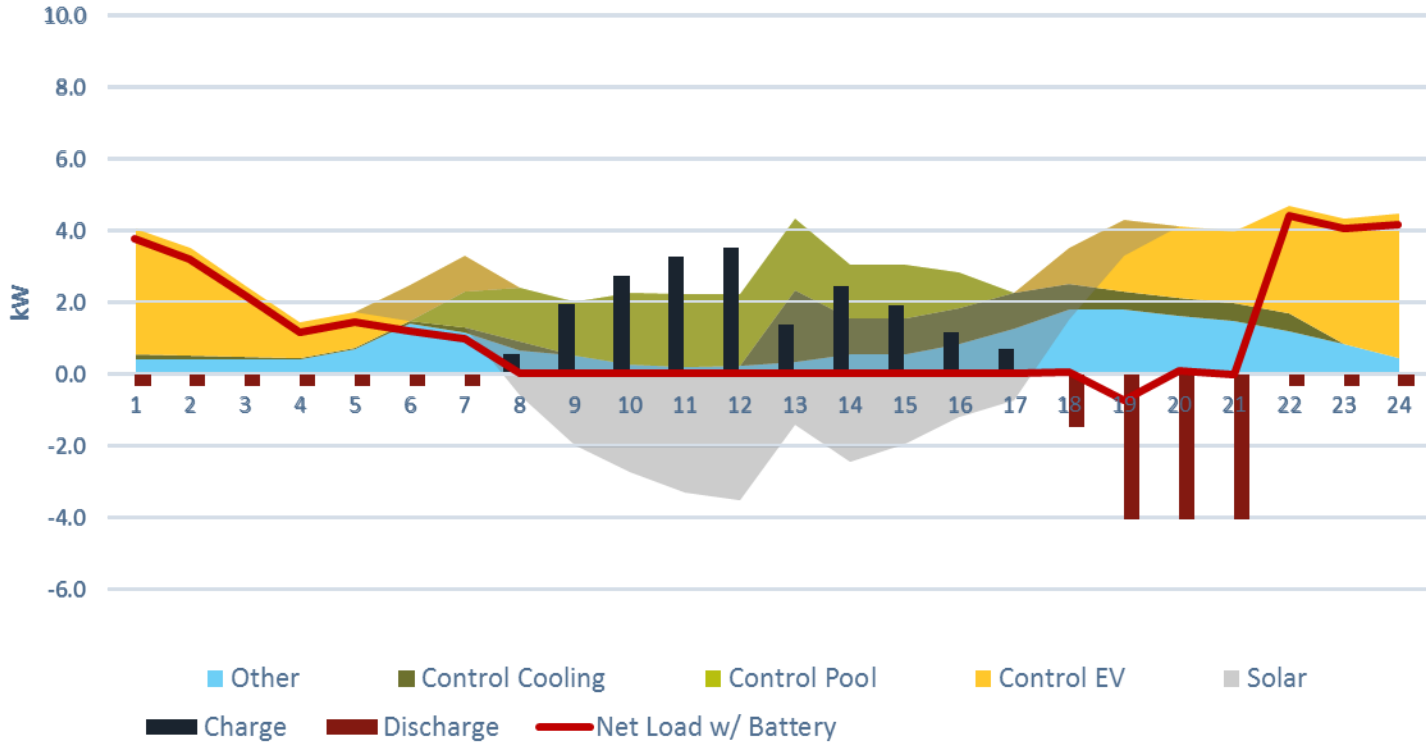
"LOAD
DISAGGREGATION"
PROVIDES THE NEXT
LEVEL DOWN



- Allows Utility to see what makes up the “difficult” demand patterns
- View what is “immoveable” and what could be shifted
- Enables work on Tariff and Education programs

CONTROLLING LOADS

Add Forecast, Optimization, and Control Based on Prices



KEY STEPS TO IMPLEMENTING DEMAND RESPONSE

Automation as well as Consumer Activity

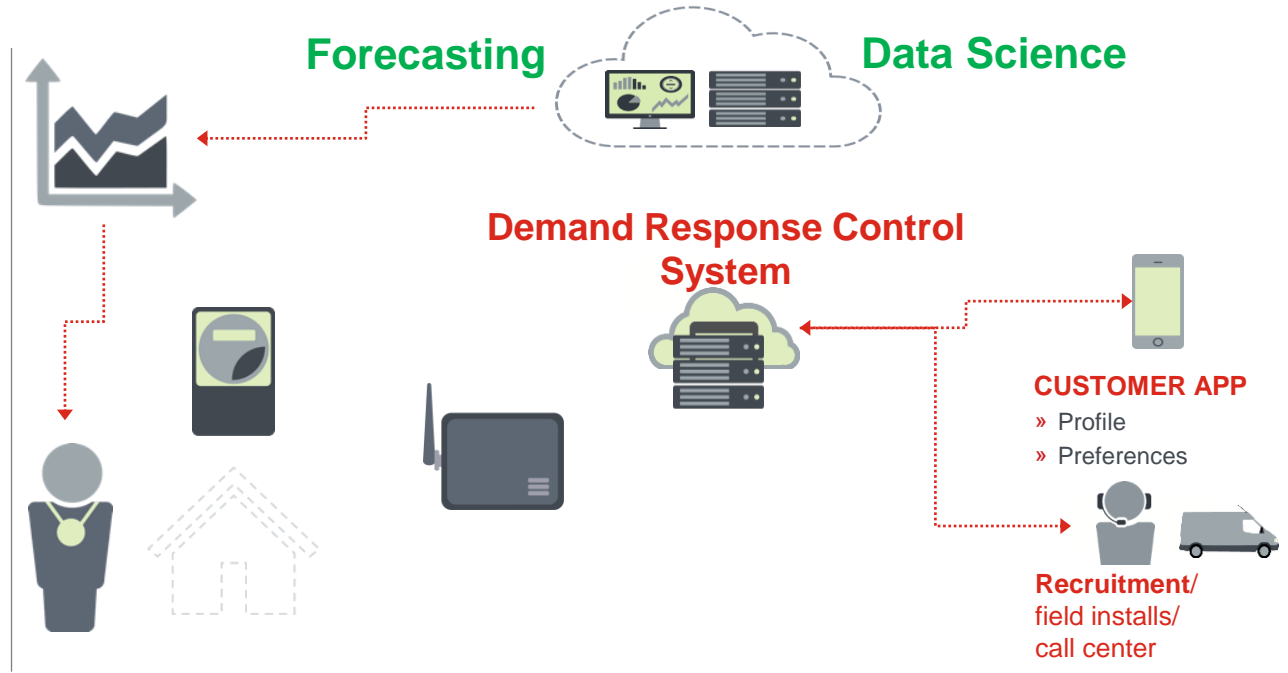
SMART METERING TO ASSESS ISSUES

LOAD DISAGGREGATION PROVIDES INPUT INTO DER STRATEGIES

TARIFFS & CUSTOMER ENGAGEMENT

DER DEVICE CONTROL

DER EVENTS FOR CRITICAL CONTROL



A Single Communications Network allows for cost effective implementation

QUESTIONS ?



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