ATCO Gas AUSTRALIA

# Natural gas residential hybrid energy system

## Gas Seminar 2017

# Outline

- Introduction
- Project overview
- The first residential hybrid energy system using natural gas
- Key learnings
- Trilemma fit
- Next steps
- Conclusion

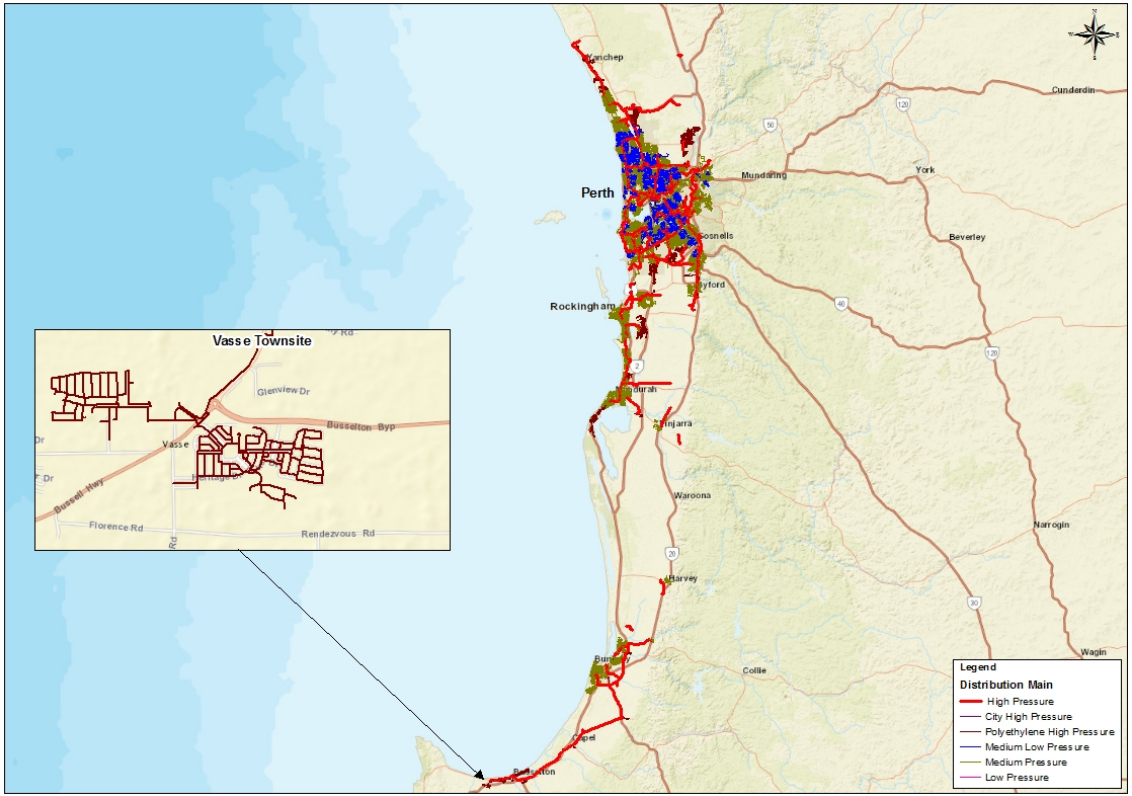

# ATCO Gas Australia

- Owns, operates and maintains WA's largest gas distribution network
- More than **14,000km** of pipelines
- Connects over **740,000** consumers
- Approx. **250km** of new pipeline and **20,000+** new connections per annum
- Employs more than 300 people

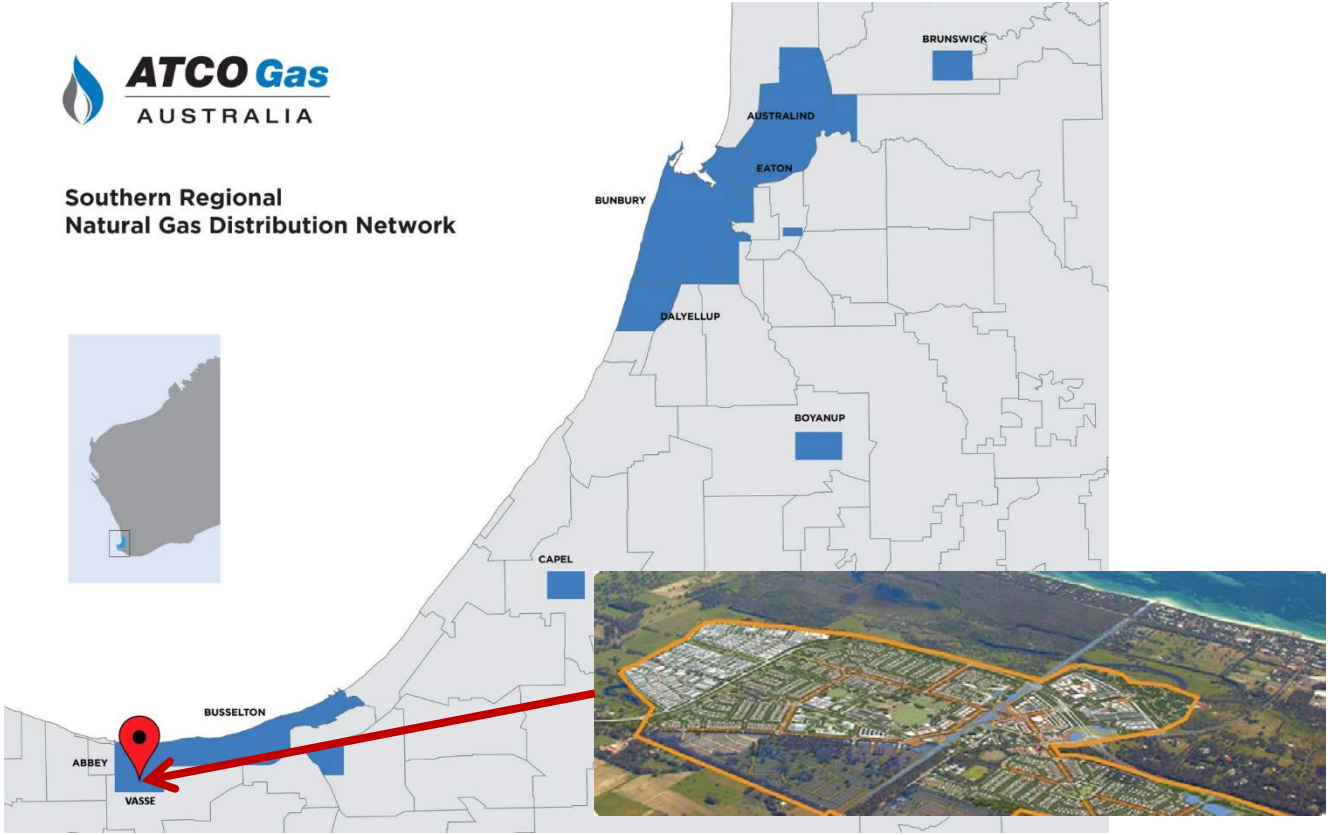
# Overview

- **What?**
  - Research and development pilot project
- **Why?**
  - To investigate the role of natural gas in a hybrid residential energy solution
  - Solar PV + battery + gas generator
- **Where?**
  - Busselton area: edge of ATCO Gas Australia network and impacted by electricity voltage constraints
- **How long?**
  - 6-12 months covering a pea Winter and peak Summer period

# Edge of grid

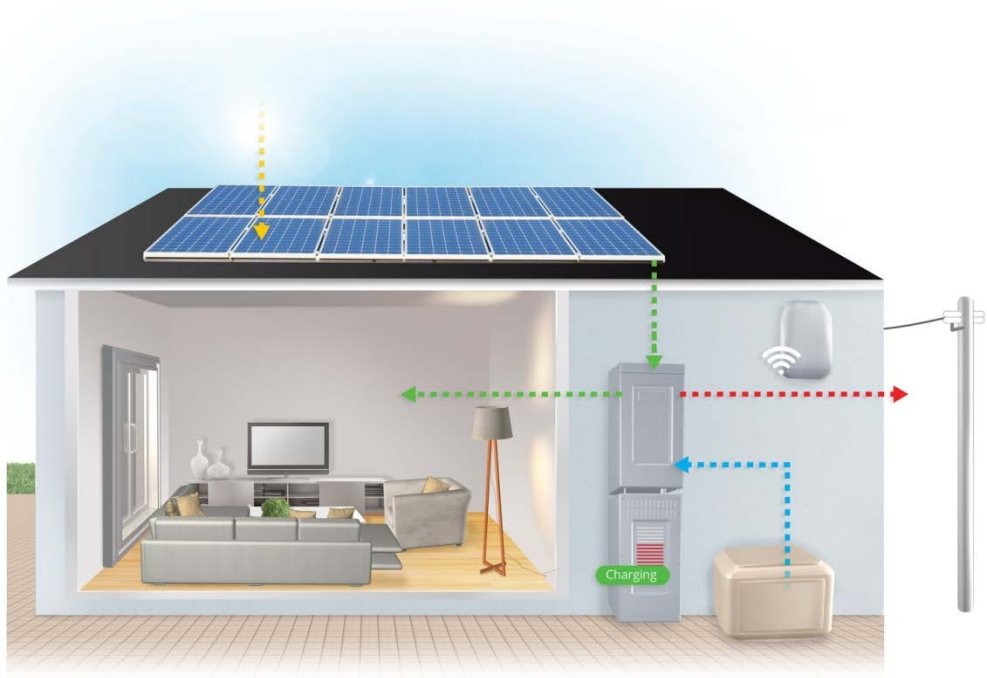

Vasse Townsite
Glenview Dr
Busselton Byp
Vasse
Bussell Hwy
Florence Rd
Rendezvous Rd
Perth
Rockingham
Mandurah
Waroona
Harvey
Collie
Busselton
Bunbury
Yanchep
Cunderdin
Mundaring
York
Beverley
Narrogin
Wagin
Legend
Distribution Main
High Pressure
City High Pressure
Polyethylene High Pressure
Medium Low Pressure
Medium Pressure
Low Pressure

# Vasse


ATCO Gas
AUSTRALIA
Southern Regional
Natural Gas Distribution Network
BRUNSWICK
AUSTRALIND
EATON
BUNBURY
DALYELLUP
BOYANUP
CAPEL
BUSSELTON
ABBEY
VASSE

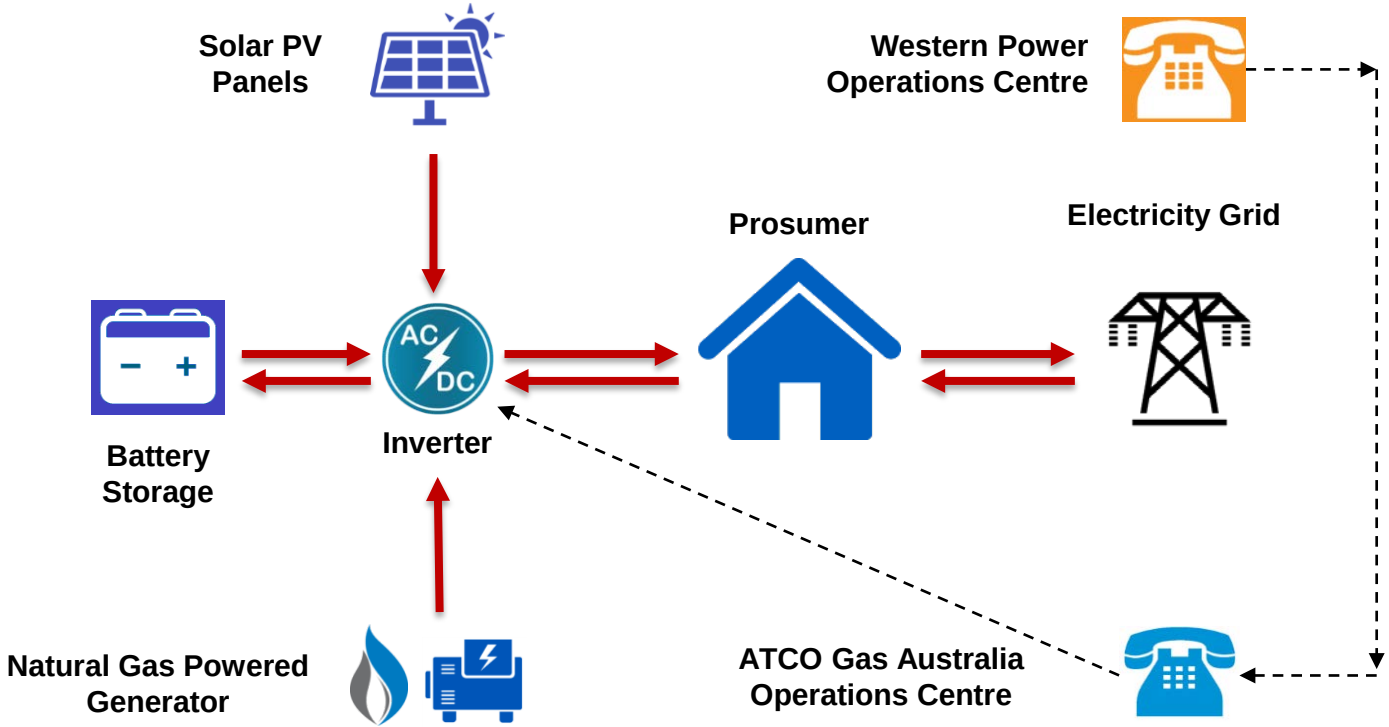
# Residential hybrid energy using natural gas

- **For nine selected houses with rooftop solar PV systems, ATCO has installed:**
  - Natural gas generator
  - Smart inverter
  - Battery storage
  - Communication system




- **Pilot plant:**
  - Pre-installation test in Jandakot
  - To raise and resolve technical problems
  - To train staff to install the system
  - Showcase for stakeholders

# The concept – fully integrated



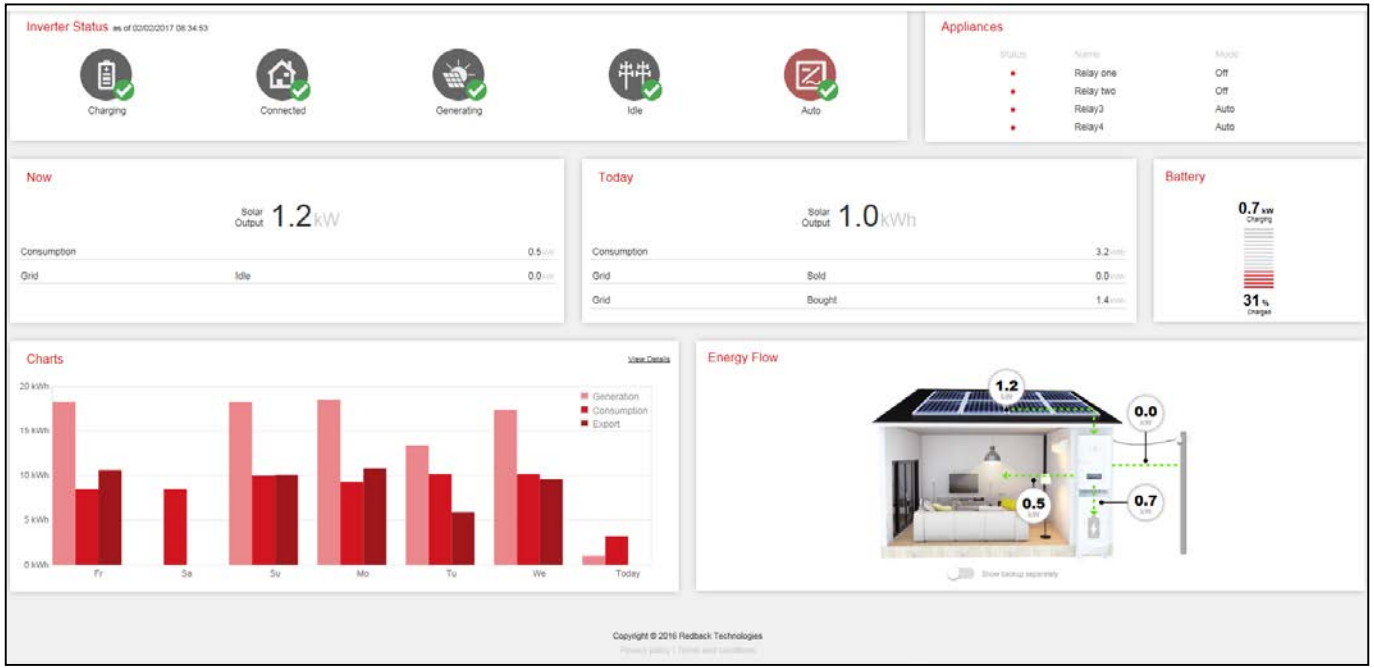
# Pilot plant


Communication box
Inverter + Battery
Generator
Generator
GENERAC

# Vasse residential hybrid energy system



# Customer interface



# Key learnings

- **Primary loop**
  - Cannot export, can only connect to back up circuit (fridge/freezer/common area lighting)
- **Technical**
  - Battery and invertor manufacturers have not considered gas generators as input
  - Taught invertor to think the generator is another solar input
  - Remote and auto-start
  - Noise
- **Type B appliances**
  - Requires Energy Safety approval
- **Consumer behaviour**
  - How customers use energy - changing behaviours
- **System sizing**
  - Optimising the battery and generator size
- **R&D Project Management**
  - Validated learning and innovation accounting

# Benefits

- Demonstrate that natural gas can be part of the residential energy mix
- Present a new gas-based solution for electricity peak demand problems in specific areas
- Maintain residential gas connections
- Make it easy to connect gas
- Opportunities to collaborate with other businesses

# The energy trilemma fit

Provide customers with innovative and cost effective energy solutions to meet their needs and enable them to achieve greater success

## Affordability

Optimum sizing to reduce capital

Future proof energy solutions

## Reliability

Operational Excellence Health & Safety

Bottomless battery

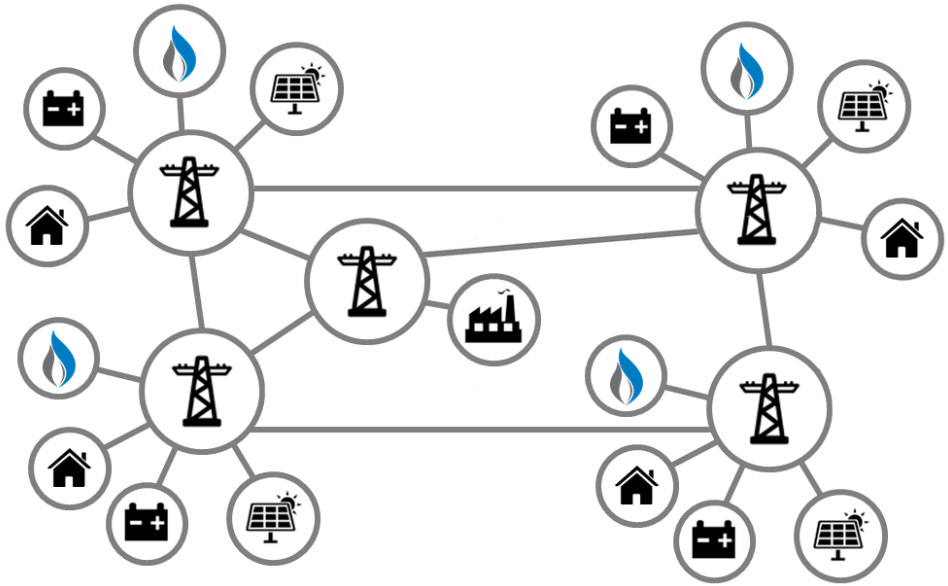
## Sustainability

40% reduction on CO2 emissions

Grow and extend existing assets

# Next steps

- **ATCO Gas Australia Jandakot Operations Centre**
  - Commercial Hybrid Trial
- **Other Commercial installations**
- **Scale-up to subdivisions**
- **Microgrids**



# Challenging landscape

Competitive Energy Alternatives

Shift to Cleaner, Greener Energy Solutions

Consumer Control through Disruptive Technologies

Consumer Focused Regulations

Retailers as Total Energy Partners

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