FUEL CELL SEMINAR & EXPOSITION

Market launch of BlueGen: Essential experience from real-world field trials

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Ceramic Fuel Cells Ltd.
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Preface…

Technology that changes industries

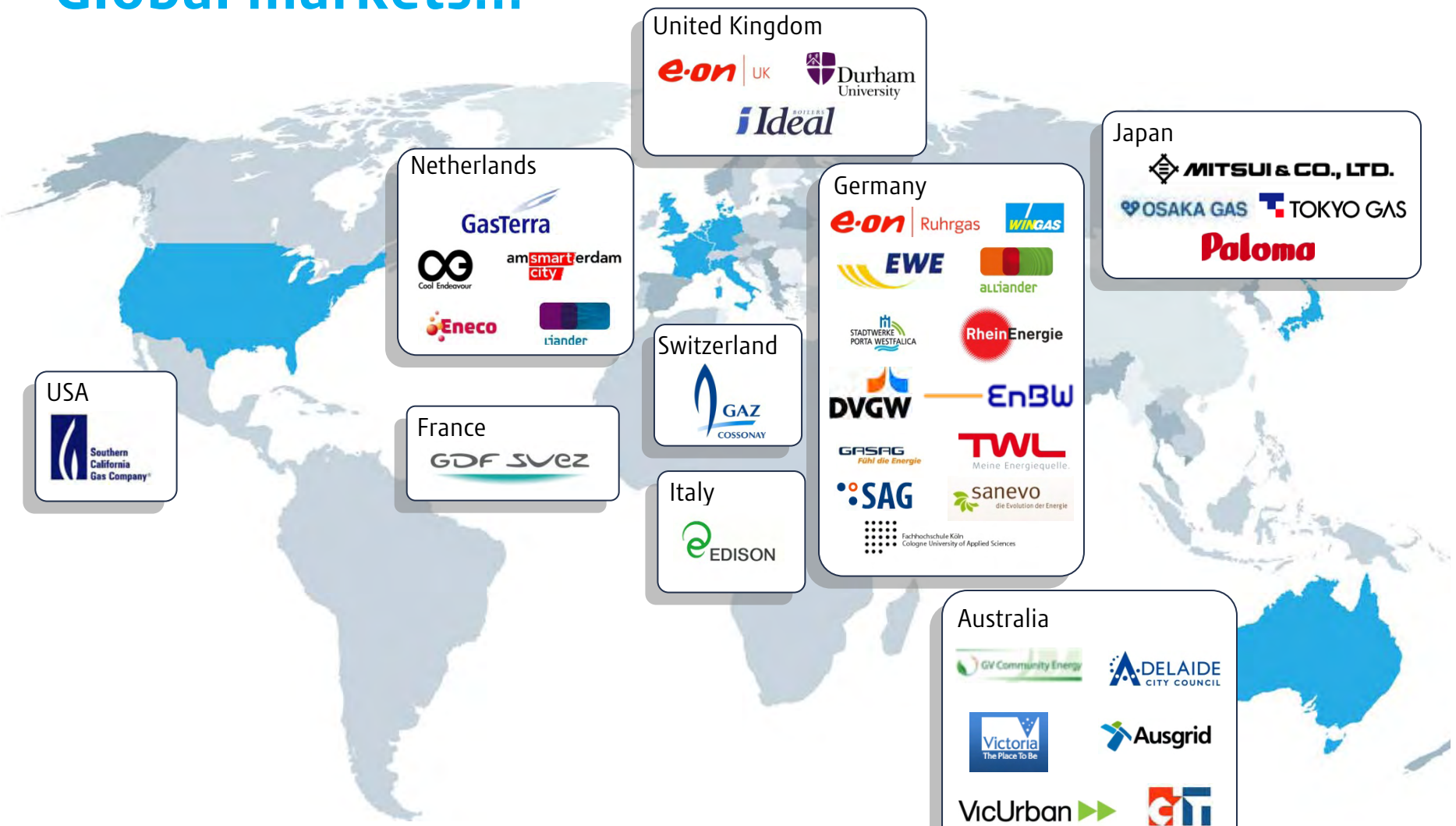
- Motorola & the DynaTAC 8000x
- Invested about $150 million
- Took about 15 years
- Launched in 1983 for $4,000
- Remember the movie Wall Street?

About us...

Ceramic Fuel Cells Limited (CFCL)

- Commercializing SOFC technology for stationary applications
- Formed in 1992;
  - From the Australian Government research institute (CSIRO)
  - Employs approx. 130 staff world-wide
- Head office in Melbourne, Australia;
  - Ceramic powder plant in United Kingdom
  - Fuel cell stack assembly plant in Germany
- Listed company [code: CFU];
  - Australian Securities Exchange (ASX)
  - London Stock Exchange
    Alternate Investment Market (AIM)
- More than USD $280 mil. invested in technology development

Global markets...



Our product…

Residential & light commercial on-site power generator

- Controllable with high electrical efficiency
- Easy to install & virtually silent – no noise, no vibrations

Voltage/frequency:	230V/50Hz or 220V/60Hz
Electrical power:	1.5 kW nominal
Peak electrical efficiency:	60% at 1.5 kW
Overall efficiency:	Up to 85%
System design life:	10 to 15 years
Compliance:	Europe & USA*
Grid connection:	Parallel
Fuel:	Natural Gas
Monitoring:	www.bluegen.net
Waste heat recovery:	Integrated

* (Q4 2011)

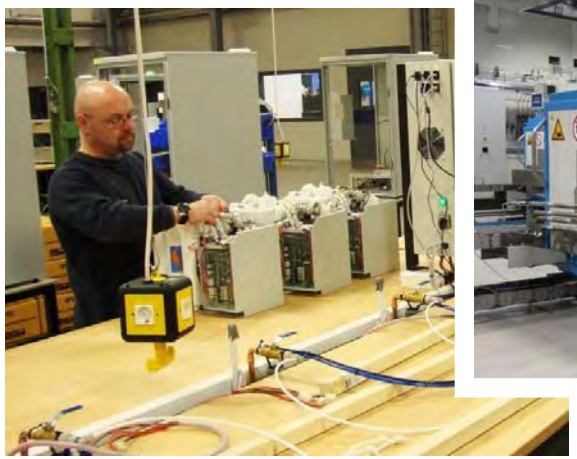
Update...

What's new from our side

Corporate update…

Manufacturing

- BlueGen assembly in Germany
  - Flexible & scalable 'manufacturing cell'
  - Production capacity from 1,000 systems p.a.
- Assembly & testing of key components
  - Water treatment
  - Air delivery
  - Power management
- Final testing
- Warehousing



→ US$13.5 mil. (€9.5 mil) 45,000 sq.ft. assembly plant in Heinsberg

Market update…

Markets

- Europe the still the leader for commercial volumes;
  - Germany
    - *EWE order for 200 [integrated] CHP units*
    - *Saneveo order for 100 BlueGen units*
  - Netherlands
    - *Zestiq order for 100 units BlueGen*
  - United Kingdom
    - *Microgeneration Certification Scheme approved*
- Now focusing on the USA;
  - North American approvals underway
  - CSA, ANSI/CSA: FC 1, UL 1741, IEEE 1547 etc.
  - On target for late this quarter

Product update…

Certification & development

- Requires a more structured approach (e.g. change requests)

Sales

- Orders for 306 BlueGen units in nine countries
  - Plus over 200 integrated micro-CHP units with utility partners

Distribution

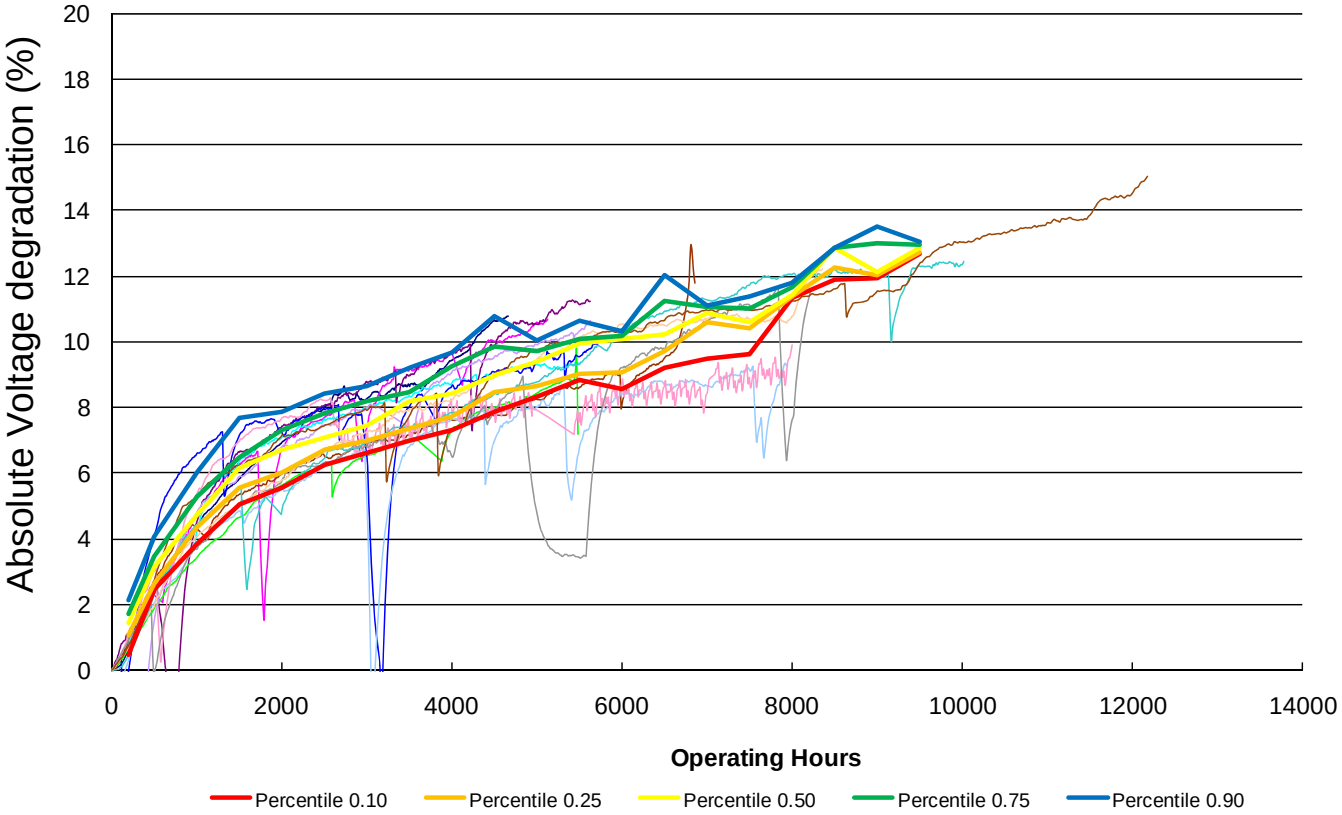
- Distributors in UK, NL, DE and AU
  - Energy market regulations in each country define the 'customer'

Promotion

- New multi-language website www.bluegen.info
- Customer monitoring website www.bluegen.net

Technology update...

Voltage degradation

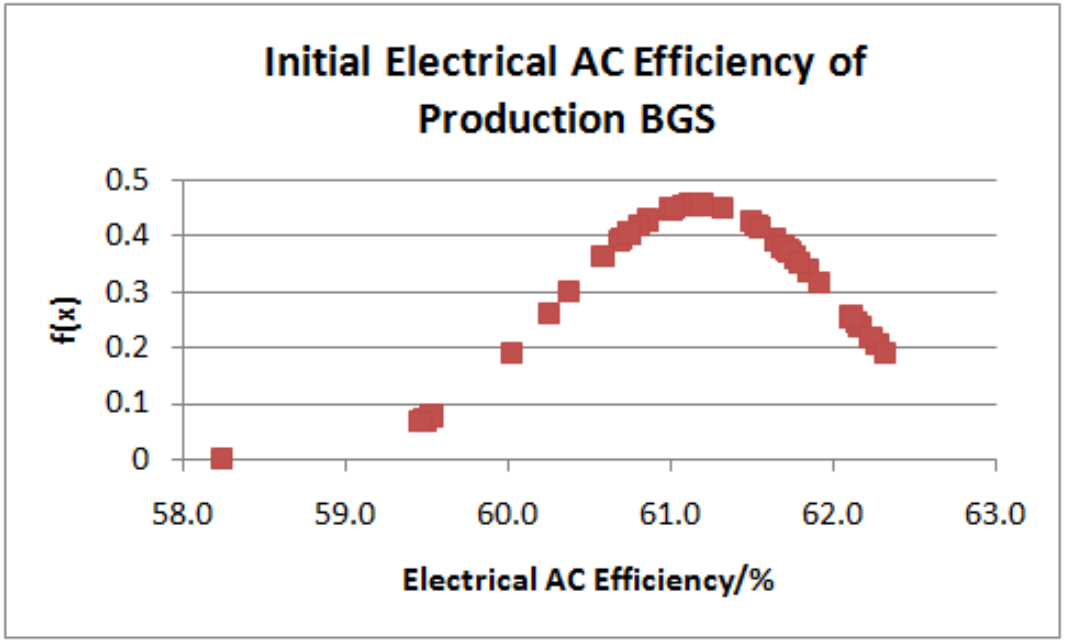


- Degradation is relatively fast at the start of life and then slows dramatically
- After one year operation the overall voltage degradation rate is ~1%/1000 hours

Field trial update...

Globally

- 84 number of BlueGen systems installed
- Virtually all installed systems utilize heat recovery
- Majority of systems have a starting electrical efficiency > 60%



Case studies…

Focus on individual BlueGen installations

Australian case study…

Ausgrid 'Smart Home'

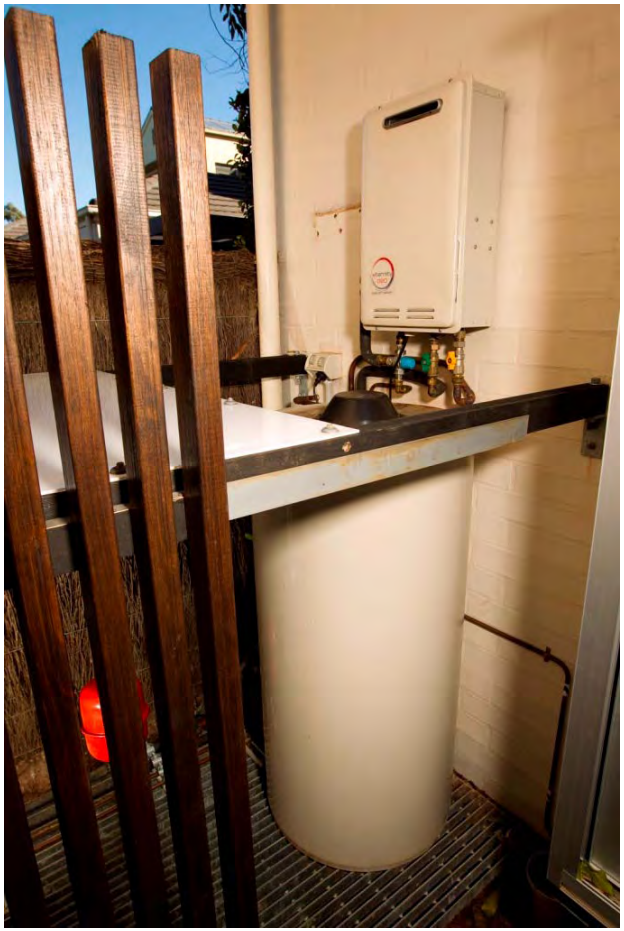
- Renovated home in Sydney – showcase existing energy technologies
  - PEV, solar PV, energy storage, energy efficient appliances & BlueGen
- The smart home is real – being 'road tested' by a family of three
  - Normal life, but… blogging about their experiences

  www.smarthomefamily.com.au

Sydney, Australia
Ausgrid & Adams/Joyce
Installed August 2010

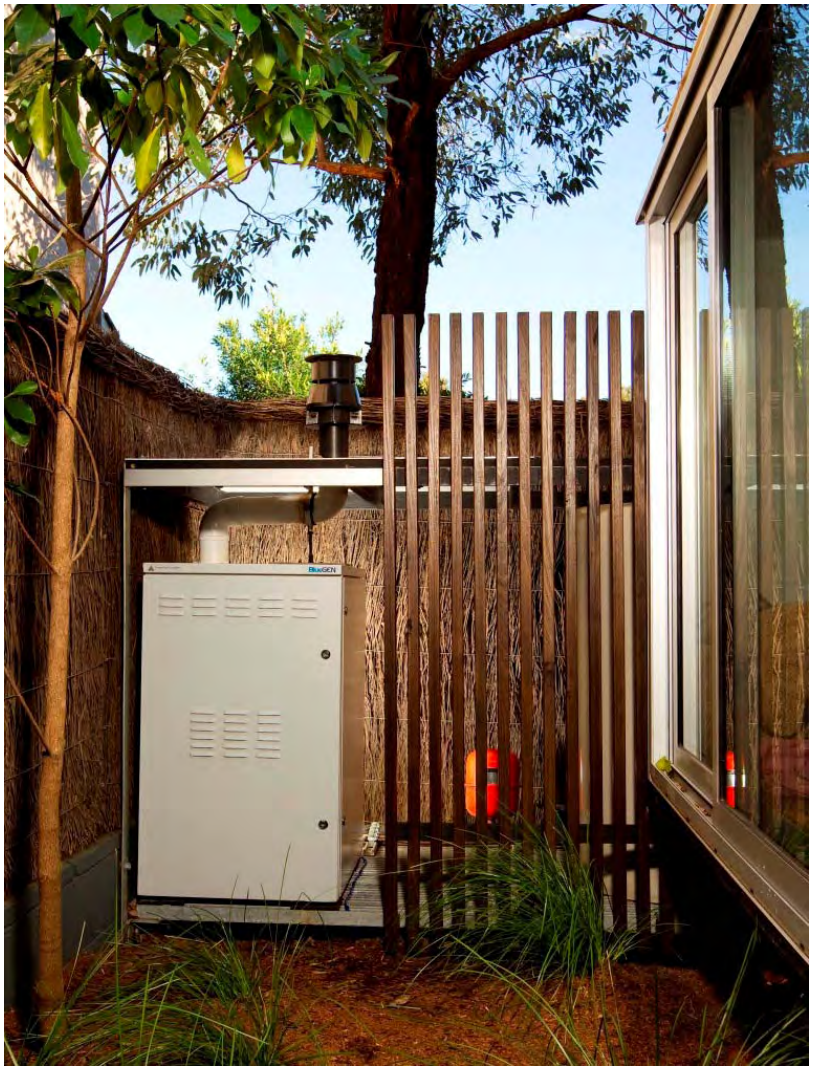
Australian case study...

Installation photos



52 gal. hot water tank & booster

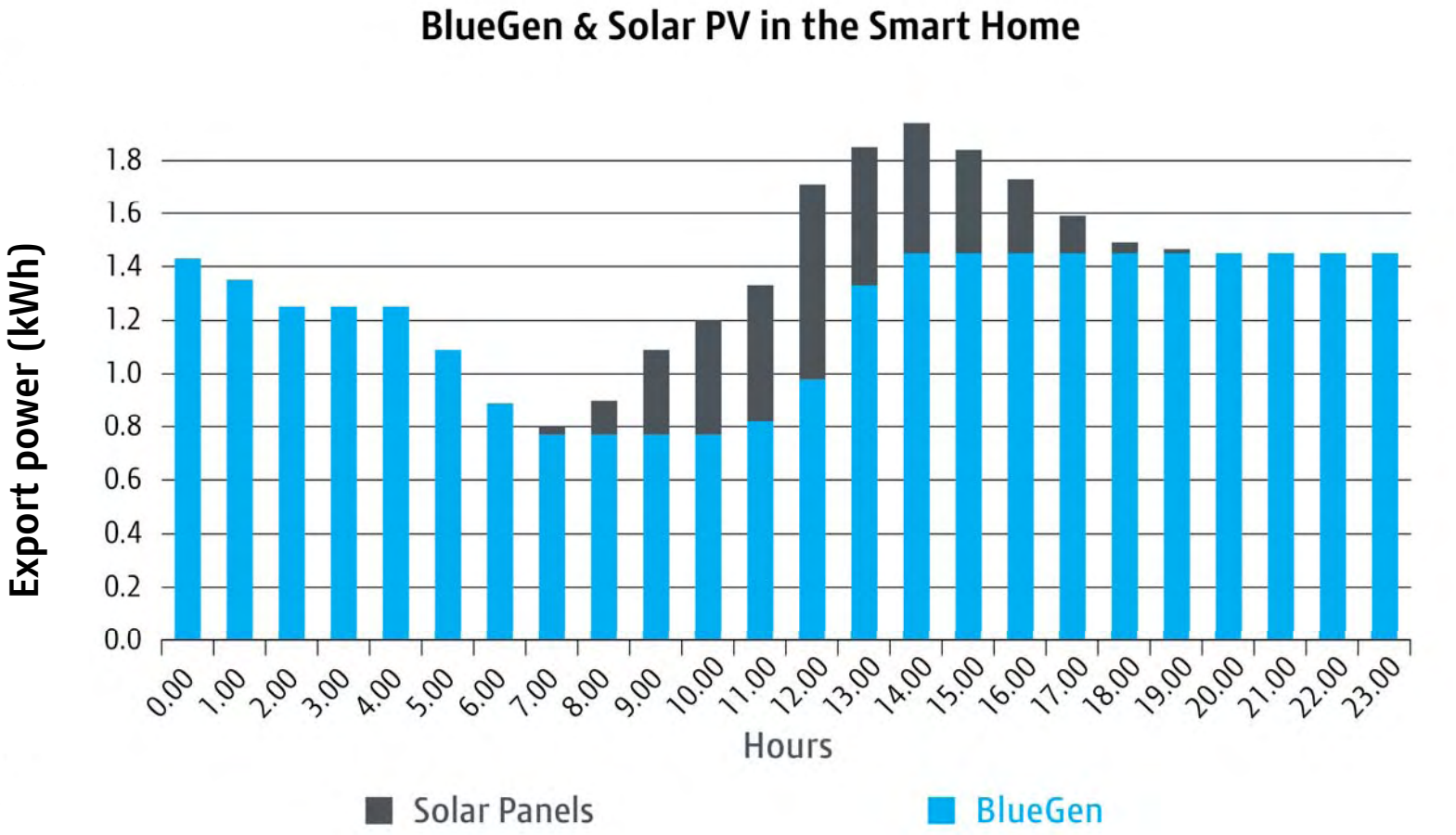
Courtyard installation



Australian case study...

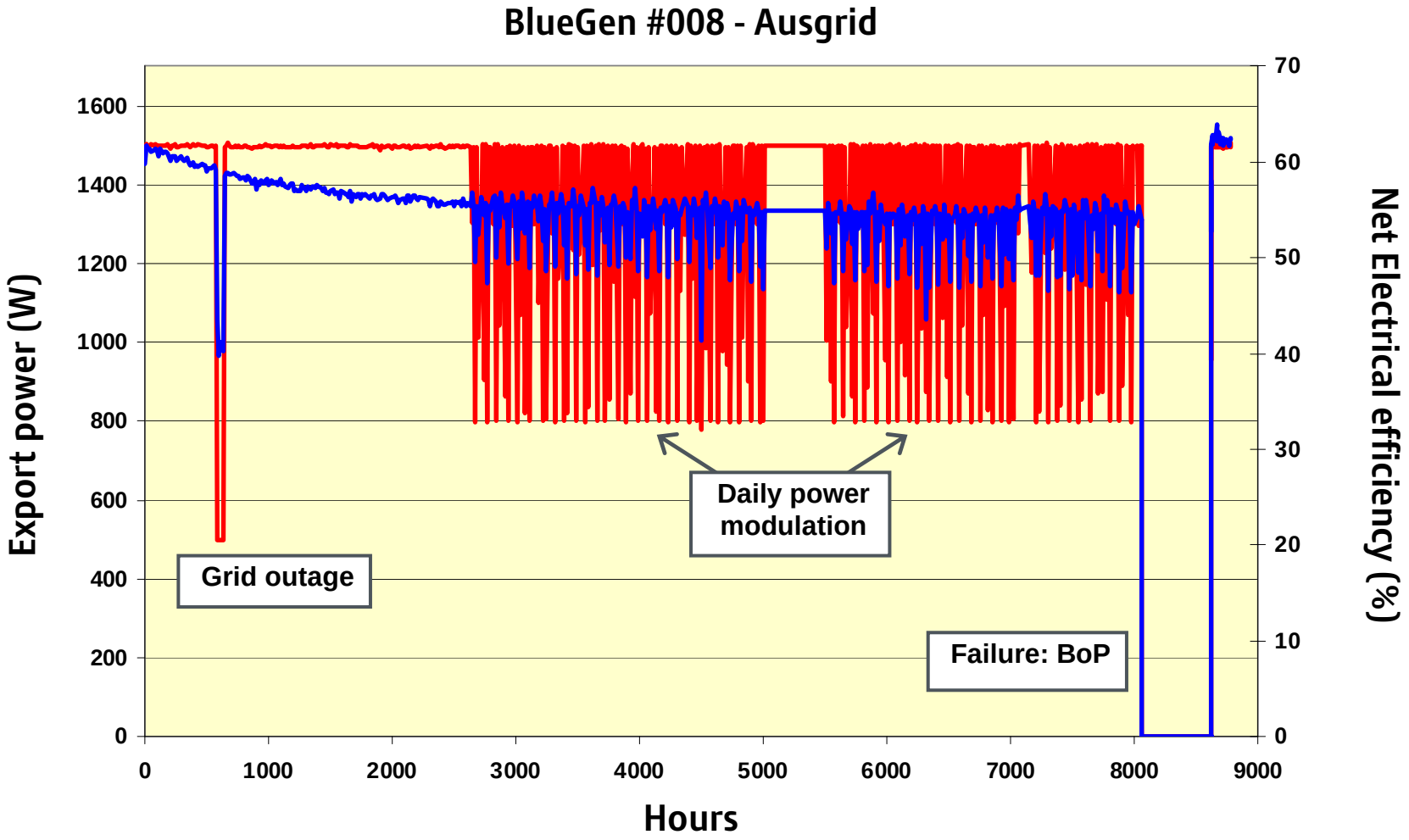
Power modulation capability

- Turn-up or turn-down the power output from BlueGen (prioritize PV)



Australian case study...

BlueGen performance



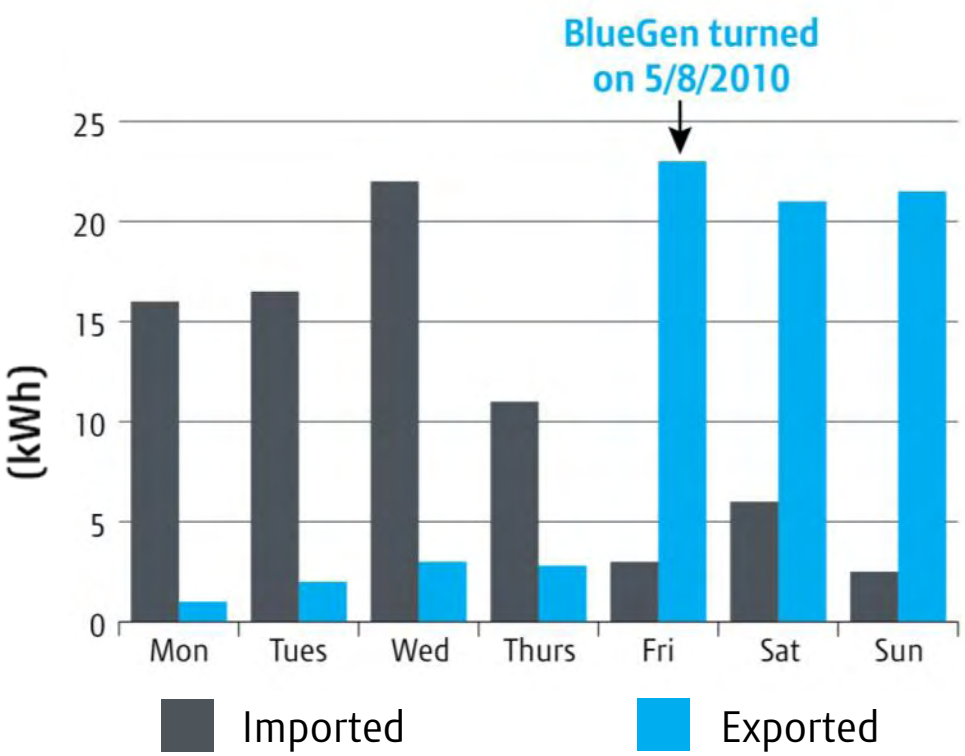
Australian case study…

'Smart Home' results after 12 months

- Run time of approx. 8,700 hours – with >91% availability
- Exported approx. 10,700 kWh
- Av. electrical efficiency 56%
  - Saved ~7.8 tonnes of carbon
- Operation in varying modes
  - i) constant 1.5 kW
  - ii) daily modulation profile

Key learning

- Power modulation to accommodate Solar PV
  - Smart Grid trial 25 units



German case study…

Alliander 'Energietisches Musterhaus' (model energy house)

- Former industrial park fire brigade renovated into an office
- Incorporates five different energy technologies
  - Solar PV, wind turbine, solar thermal, condensing boiler + BlueGen
- Understand how BlueGen interacts with other DG sources
  - Installed in the employee 'break room'

Heinsberg, Germany
Alliander Netz AG
Installed June 2010

German case study…

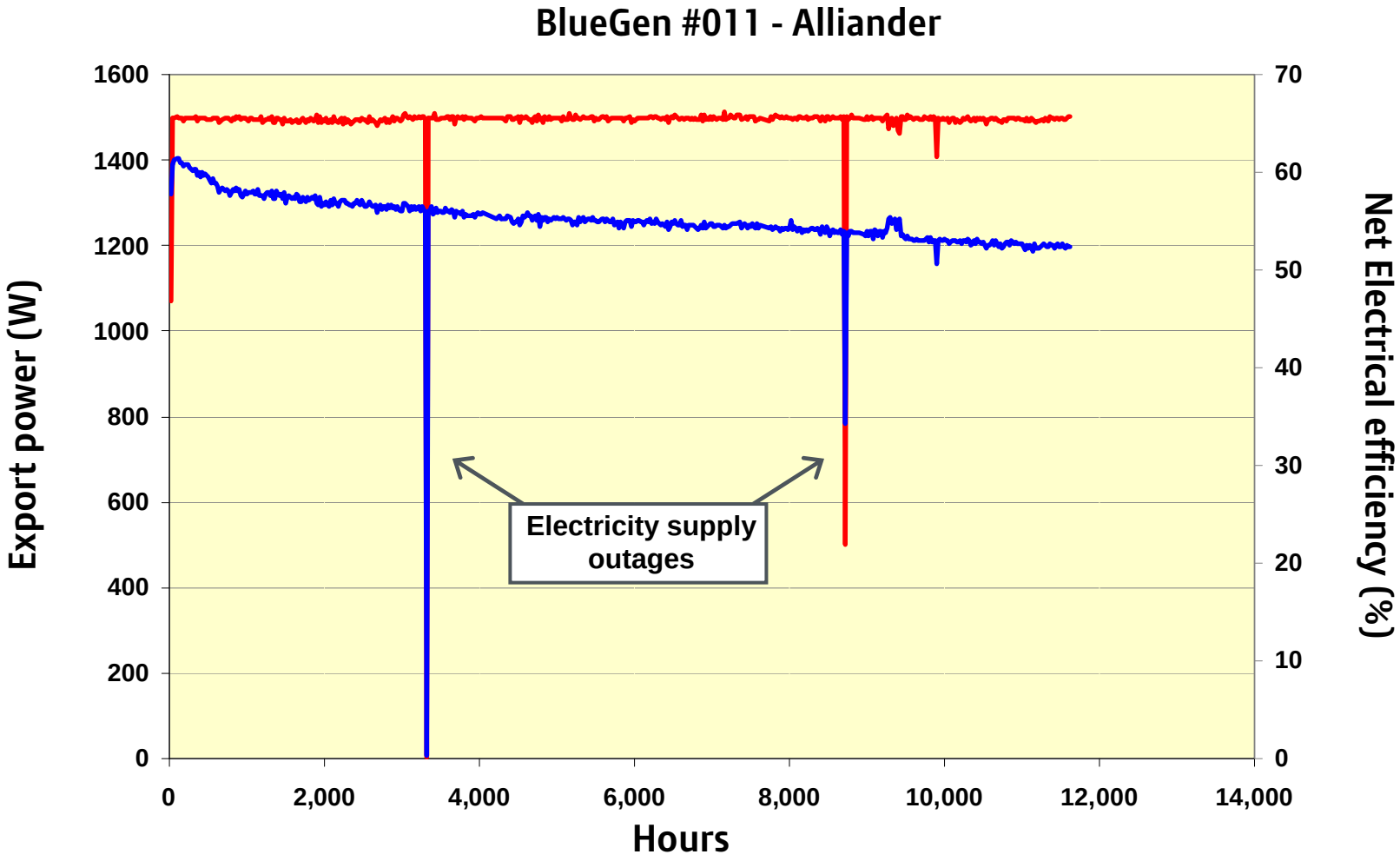
Installation photos

Indoor installation with 158 gal. tank →

↓ Alliander combines three renewable energy sources

German case study…

BlueGen performance



German case study…

'Energietisches Musterhaus' results after 16 months:

- Run time of approx. 11,700 hrs – over 98% system availability
- 1.5 kW constant output – generating approx. 17,500 kWh
- Reducing voltage degradation:
  - declining to less than 1.32%/1,000 hrs
- Net electrical efficiency:
  - 60% starting efficiency to 53% after 16 months operation
- Thermal efficiency varies with building thermal demand
  - 15% to 25% depending on prioritization of other heat sources

Key learning

- Indoor installations are ideal, constant operation yields better performance, optimization for multi-source installations

Australian case study…

Adelaide Electric Vehicle charging station

- Free EV charging station powered by BlueGen + the grid + solar PV
  - Operates as a level 1 charging station
- City Council public showcase demonstration with real benefits
  - Base-load electricity for Adelaide Central Market when not charging EVs
  - Hot water for washrooms/cleaning staff

ADELAIDE CITY COUNCIL

Adelaide, Australia
Adelaide City Council
Installed December 2010

Australian case study…

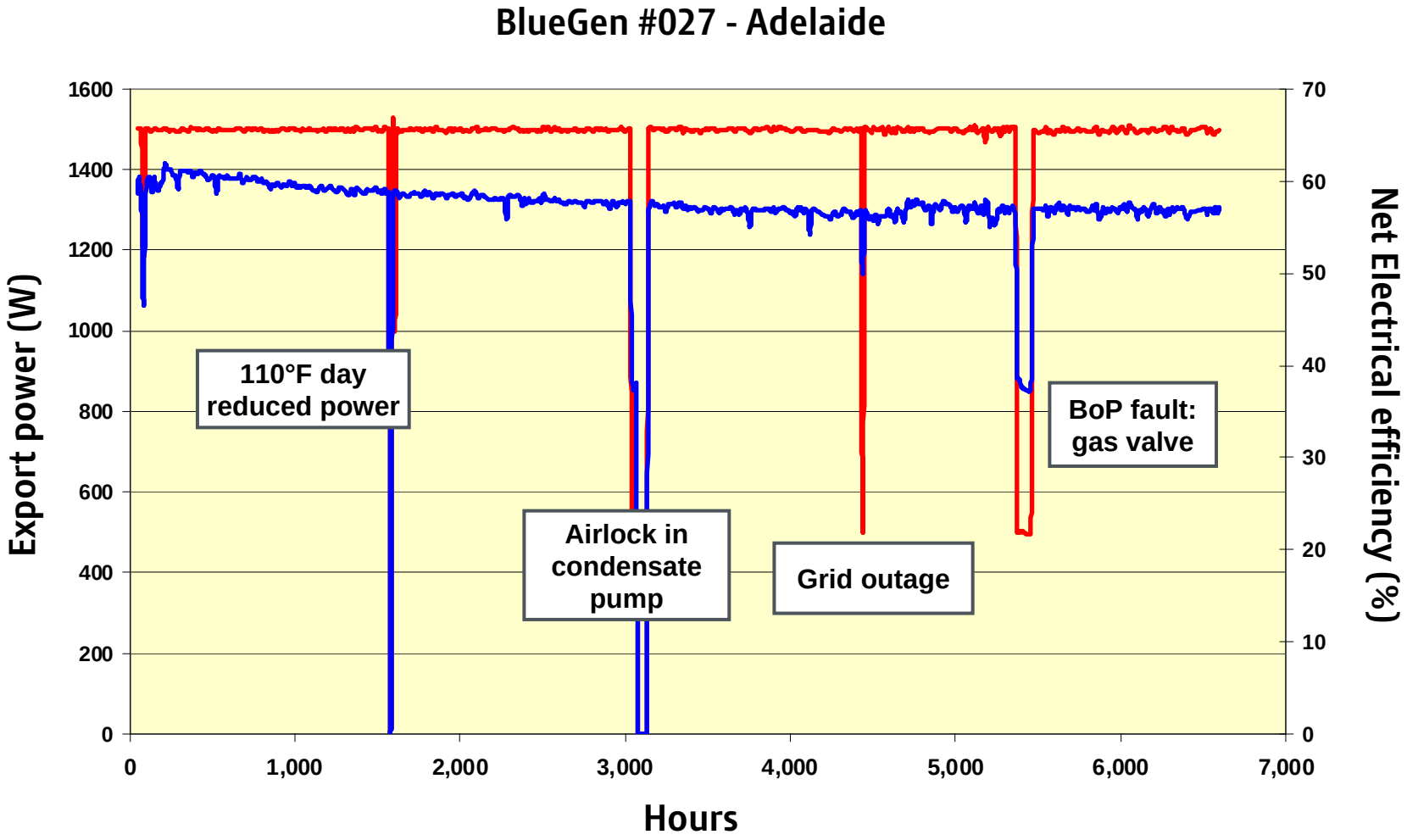
Installation photos

52 gal. tank thermal connections

Adelaide Lord Mayor
Stephen Yarwood

Australian case study...

BlueGen performance



Australian case study…

EV charging station results after 9 months

- Run time of approx. 6,600 hrs – over 97.8% system availability
- ~1.5 kW constant output – generating approx. 9,536 kWh
- Voltage degradation:
  - <1.25%/1,000hrs after 6,600 hrs operation
- Net electrical efficiency:
  - 62% peak, average of 56.8% after 9 months operation
- Very high thermal efficiency with 71 gal. of hot water used per day
  - Thermal metering + electrical efficiency confirms over 85% total efficiency

Key learning

- Car park installation poses unique challenges
  - Flue installation, security & access, and routine servicing

Wrap up…

Bringing it all together…

The final word…

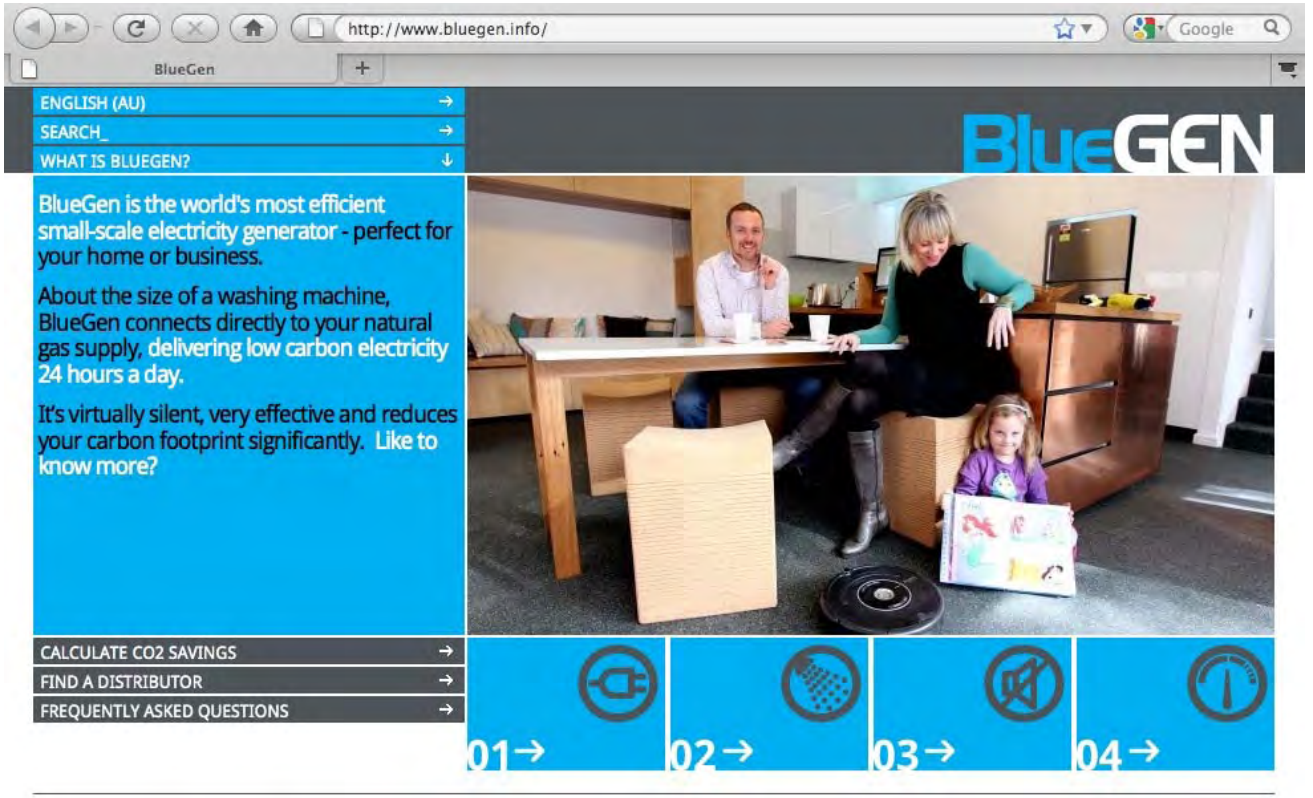
It's still challenging:

- BlueGen sold in nine countries
  - Building the order book – 306 BlueGen orders
  - Installing the units – 84 BlueGens installed
- Multiple compliance & certifications raise additional complexity
  - Disciplines need to be in place

Real-world reality:

- Real installations, real customers & associated expectations
- Common product – different product offering for each market
- Distributor / installer training and education essential
- Provides focus for improvements in durability

Thank you…



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