Reshaping Adelaide
Renewable Energy and Energy Storage

Richard Turner CEO
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Significance of Energy Storage

“Energy Storage will become the 2\textsuperscript{nd} most disruptive technology to the Internet”
The Energy Opportunity

• Growing peak demand
• Ageing or non-existent infrastructure
• High cost of power transmission and distribution
• Unstable power networks
• Growing regional and remote communities
• Growing energy needs in developing countries
• Rising cost of electricity generation from fossil fuels
• Economic losses from supply interruptions
• Increased intermittent generation from renewables
• Rising uptake of Electric Vehicles
• Dangers of Nuclear Power Generation.
The Energy Opportunity

By 2030 the four lowest cost forms of energy generation at the source will all be renewable:

1. Solar PV
2. Solar Thermal
3. Wave
4. Onshore Wind

... Fossil Fuels

In a summary of the study’s findings, Professor Grafton concludes

“Australia’s energy future is likely to be very different to the present.” and predicts that “Australia will experience an energy transformation over the coming decades that will have a profound impact for electricity networks, how energy is distributed and on Australia’s ability to meet its targeted greenhouse gas emissions reductions.”

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Moving Towards Micro-Grids

• In many cases working with and optimising existing networks
  • What the Utilities are telling us
  • Thin grid connections utilising local Generation & Storage

• In a growing number of cases working off the Transmission Grid
  • Local Distribution Grids may be also be community owned and operated (local employment / skills / lower cost of energy)

• Many Housing Developers Nationally are coming to us now as they want their developments to be fully sustainable and Micro-Grid based and offer a long term low cost of renewable energy

• The Tonsley Precinct will become an example of an embedded city Micro-Grid (grid connected) with 3MW of Solar Generation
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**Optimising Local Renewable Resources**

- Every regional township or urban sprawl development will have its owned specific renewable energy advantages:
  - Solar Energy (Day Generation)
  - Wind Energy (Day/Night Generation)
  - Biomass (local waste dumps) – 24 hour
  - Co-generation (heat from mining or steel mills) – 24 hour
  - Enabled by Utility Scale Energy Storage

- Each Micro-Grid will be designed around an optimal mix of the above Renewable Generation resources and Energy Storage

- Studying a township now for a 70MW Renewable Plant & Micro-Grid
  - Model for national expansion
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Many new things to manage!

- Rooftop PV Solar
- Utility-scale Energy Storage
- Switches & Power Electronics
- Microturbine
- Energy Storage
- Ground PV Solar Array
- PHEVs
- Home Energy System
- Distributed Generation
Control Systems will be critical

- Our sister company, Greensmith Energy Management Systems in the USA is currently installing the largest Energy Storage System in the world (20MWh) and have designed a full Operating Platform around optimising and controlling Energy Storage in networks.
ZEN Freedom PowerBank in Outback Australia
ZEN Urban PowerBank Development
ZEN Innovation Centre - Tonsley
ZEN Innovation Centre - New Container Builds
ZEN ENERGY SYSTEMS ALTERNATIVE NETWORK
24 HOUR RENEWABLE ENERGY INFRASTRUCTURE

THE HOME
Developer New Home (A) equipped with a ZEN Solar Home Energy System (B) and the option of a ZEN Solar Hot Water System (C) as the Energy Generation Systems.
Combined with a ZEN Freedom PowerBank Energy Storage System (D) fully integrated with the Solar Home Energy System (B) and Back-up Gas Generator (E).

THE STREET
Local gas tank shared between two streets, providing metered gas supply to the home’s backup gas generator (able to maintain full electrical redundancy).
Generators run infrequently, only for top up of ZEN Freedom PowerBank Energy Storage System in case of inclement weather or excess power demands. Option of providing gas for cooking or boosting of Solar Hot Water System.
Local gas tank to be topped up monthly by developer.
Funding of Micro Grids

• Banks now understand the fundamental economics of Renewable Energy and very keen to fund Renewable Energy infrastructure.
  • We are working close with Bendigo Bank (community focussed) and the China Construction Bank (large scale infrastructure)

• These funds are then converted to tariff structures that are billed to the local customers via our retailing arm in long term contracts and in most cases will be a lower cost of power than from traditional sources.
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Our Long Term Advantage

• Professor Ross Garnaut was quoted in a recent article in the Financial Review...

• “Australia and South Australia in particular, has the best climate in the world for producing Renewable Energy....Renewable Energy will quickly become the lowest cost form of energy generation and if we can harness local Micro Grids and avoid our high cost of transmission and distribution we will have a significant global advantage in our advanced manufacturing industries”

• Our vision is to create Australia’s first “Renewable Utility”
Prince Charles Inspection

Honoured Technology

ZEN was selected as 1 of only 4 companies to present to Prince Charles (November 2012)