Harnessing the Power of the Sun: Future of Solar Energy

Brian Cox
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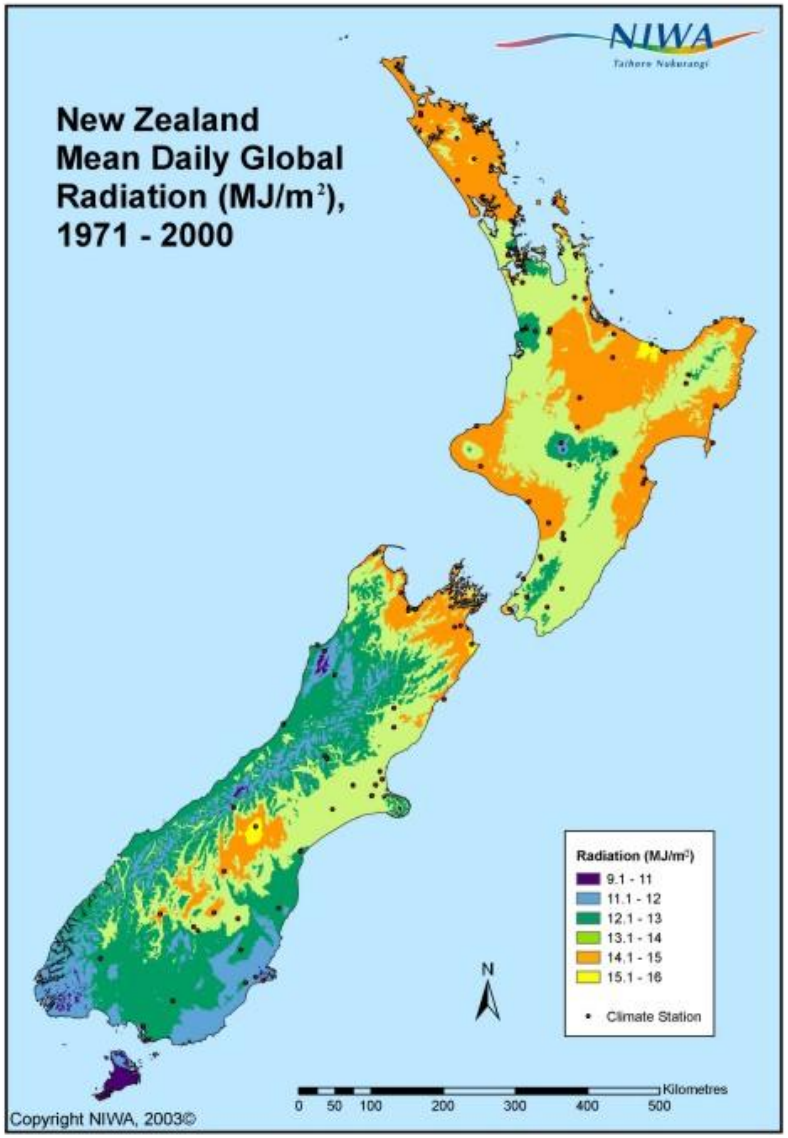
Solar - Smarter

Solar Throughout NZ



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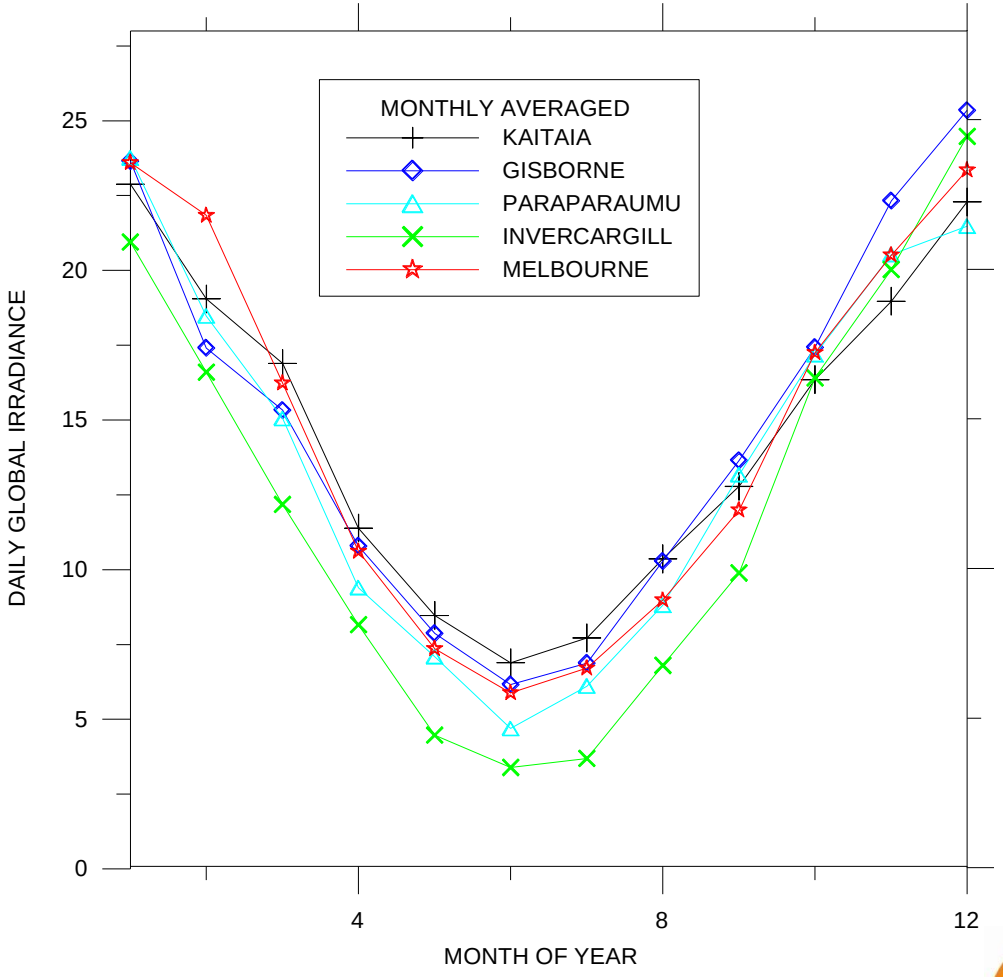
Solar Throughout NZ



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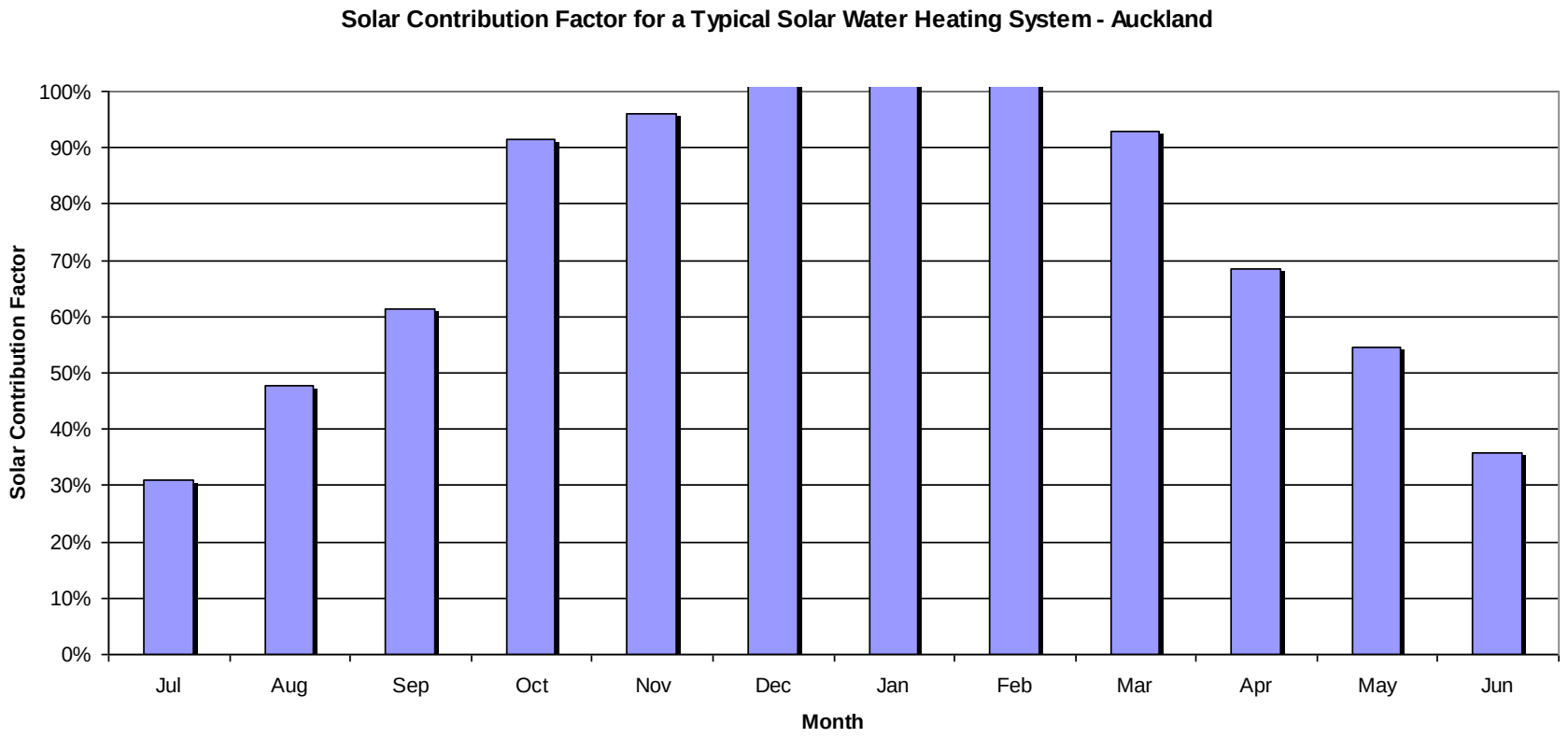
All Year Energy



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International Comparison

	MJ/m^2/yr
Kaitaia	5288.1
Paraparaumu	5035.1
Gisborne	5385.9
Christchurch	4898.0
Invercargill	4651.9
Sydney	6150.3
Melbourne	5301.6
Germany	3609.0

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The Solar Portfolio

- Passive solar
  - Building design and orientation
- Solar photovoltaic
  - Off – grid
  - Grid connected
- Solar thermal
  - Domestic hot water
  - Commercial / industrial water heating
  - High temperature heat and electricity

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Passive Solar

- Often the cheapest renewable investment a new home builder can make
- Costs minimal if:
  - Considered from the beginning of design
  - Can be incorporated by building orientation
  - Design features can increase heat received
  - Heat storage can also be incorporated
- Doesn't involve other equipment and no maintenance
- It's a no brainer

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Electricity Generation

- Photovoltaic cells
  - Silicon wafer
  - Costs fast dropping
- On-grid
  - Currently expensive
- Off – grid
  - Farm applications
  - Motorway phones, calculators, niche applications
  - Require batteries

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Solar Water Heating

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Types of Solar Water Heating System

- Collector
  - Flat plate
  - Evacuated tube
- Heat transfer
  - Thermosiphon
    - Close coupled
    - Closed loop
  - Pumped
    - Open loop
    - Closed loop
- Supplementary heating
  - Emersion electric
  - Instantaneous
    - gas
    - electric

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Potential of Solar Water Heating

- 20% of household energy can be avoided
- Currently 30,000 houses have solar water heating
- Equivalent of a half of the electricity consumption of Nelson is avoided already
- With basic and cost effective policy initiatives could be;
  - 1.5 Nelson electricity supply by 2015 ,
  - 12 Nelson supply by 2035 (30%existing, 60% new, 10% rental)
- Commercial applications will save significant amounts of energy

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Commercial and Industrial

- Motels / Hotels
- Resthomes
- Motor camps
- Institutions (hospitals, hostels, prisons etc)
- Industrial hot water

Residential

- Existing or new

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Community/Farm Amenities

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Contribution Towards Climate Change

- Attraction of SWH as a significant mechanism for combating Climate change
- Investors are also the direct beneficiaries
- Distributed investors
- Can be installed in most parts of NZ
- Value increased if ETS credits aggregated
- A climate change mitigation already established and available

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For the investor

- Reliable
- Long life
- Efficient
- Better investment than with banks
- Limited maintenance and on-going costs
- Major electricity savings even in winter
- Save about $400-800 per year

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Current State of the SWH Industry

- Well established product range
- Competitive number of suppliers
- Widening number of experienced installers
- Established standards
- Established training and accreditation of installers

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A Quality Based Industry

- Industry Code of Practice
- Accreditation for Supply & Installation
- Must use a Complying SWH product
- Complaints system
- Installer training
- Energy performance calculations
- System auditing
- Supplier Approved Installers

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Barriers

- Around $7-8000 upfront cost
- 12-15 year payback period
- Industry still in development phase
- Lack of skilled installers
- Few role models
- Commercial applications only competitive with cost of gas when + $20/tonne CO_2
- Not recognised in value of the dwelling
- 20% of cost can be in the Building Consent
- Over regulated Building Code checking

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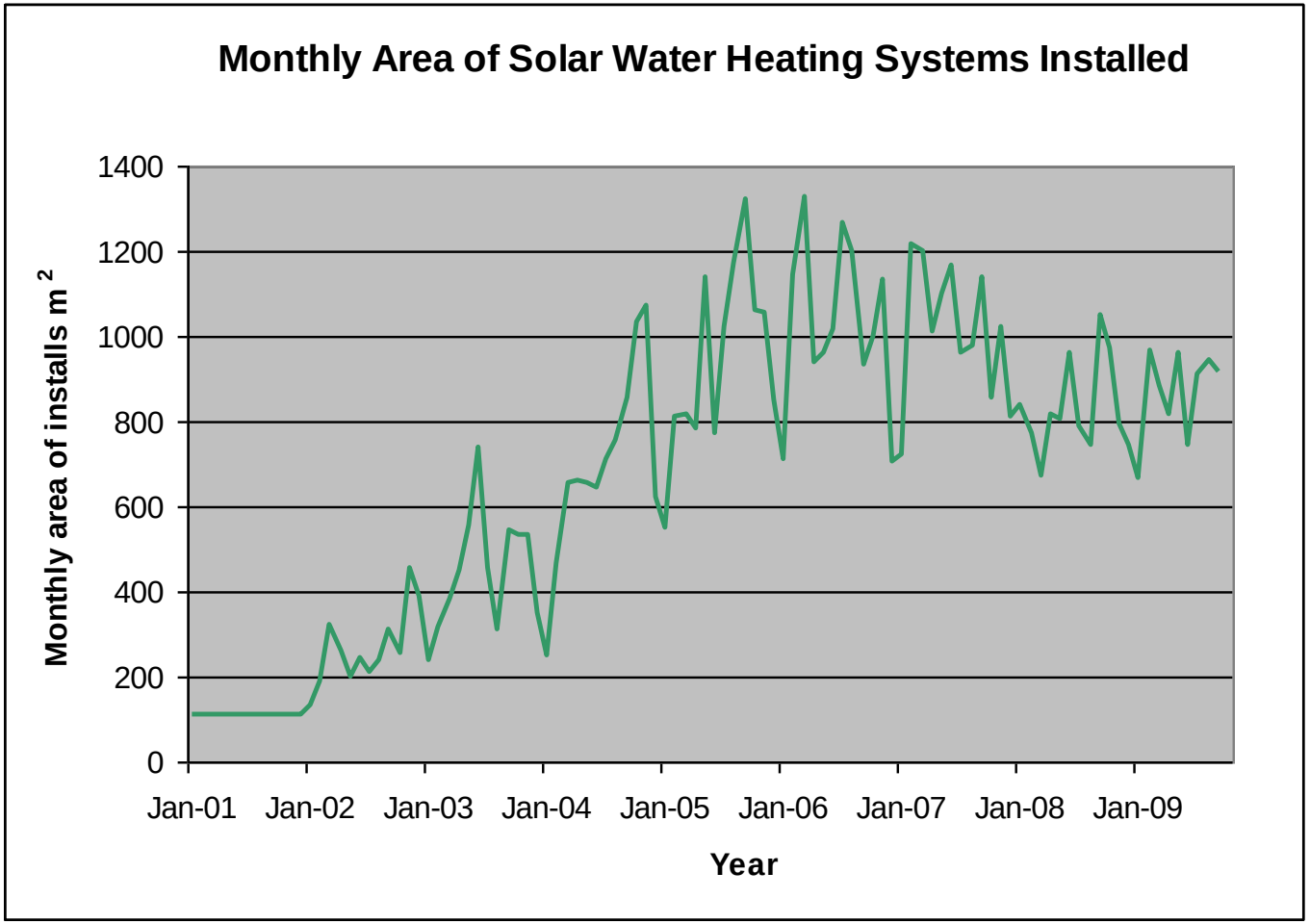
Principal Supplier Issues to be Addressed

- Experience in system specification
- Poor instructions and customer support
- Not managing customer expectations
- Poor installation follow up
- Building Code compliance

Current Ineffective Policies



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Policy Initiatives

- Promotion of role models
- Aggregation of small CO_2 reduction contributions through ETS
- Include within energy performance of buildings through Building Code
- Home Energy Rating Scheme
- Assisting SME improve business skills
- Encouragement for trades training

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The Vision

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