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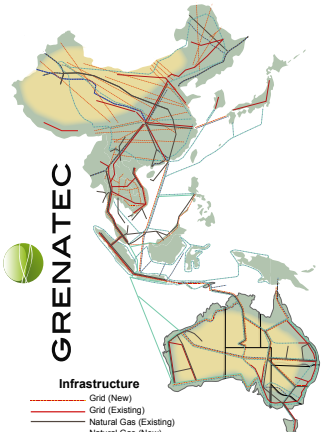
Barriers to Effective Climate Change Adaptation
Productivity Commission
climate-adaptation@pc.gov.au



Grenatec advocates a Pan-Asian Energy Infrastructure

Dear Sirs:

''Electrical equipment generally has a life of 40 to 50 years *and so we have reached the stage now where* ***much of this infrastructure needs to be replaced."***
George Maltabarow,
Managing Director,
Ausgrid

Your study "Barriers to Effective Climate Change Adaption" comes at an opportune time.

Australia's infrastructure requires replacement and expansion as part of the natural turnover cycle. **This offers an opportunity to make changes** due to freedom from the *tyranny of the status quo* is less.

Grenatec is a private research organization focused on studying the viability of a *Pan-Asian Energy Infrastructure*. The ideas we outline below are from our study "Pan-Asian Energy Infrastructure." We can provide a copy of the 250-page report upon request.

"Australia has the potential to be at the forefront of technology. *Even the possibility of being a net exporter of clean electricity is realistic for Australia."*
Albert Goller,
Chairman, Managing Director
Siemens-Australia

We argue a **bundled infrastructure of high-voltage direct current power lines, natural gas pipelines and fiber optics cables** stretching from the Southern Ocean to Siberia offers **an exciting, economic-growth inducing, future-proof infrastructure** that could serve *both* Australia *and* Asia for a century or more.

This is particularly appropriate given the **huge uncertainties climate change presents. Infrastructure flexibility and adaptability will be crucial** in dealing with these uncertainties.

"Australia should be in the lead (in solar energy) *and showing the world how it works. If you source solar energy for nothing,* ***and sell natural resources to other countries,*** *it makes for a powerful business case."*
Joe Kaser,
Chief FInancial Officer
Siemens

Grenatec argues **now's the time to think long-term** about the productivity and climate change imperatives that can be met by building out the infrastructure pathways that can last a century.

The key to this is to focus lies in **building multipurpose *networks*** that can carry all different kinds of energy. It's impossible to overstress this point.

Infrastructure connects populations with resources. These resource needs will change over time. While it's a safe bet electricity will still be used in 100 years time, how it's generated will migrate from fossil fuels to renewables.

If the focus is placed squarely on building long-lasting energy infrastructures capable to **carrying everything** from electricity to natural gas to hydrogen and biofuels, *and* that can allow for fuel swtiching, *and* that can be adapted for future fuels and that allow for ubiquitious connectivity for both suppliers and consumers and the markets to clear them -- ***basic economics will take care of the rest.***

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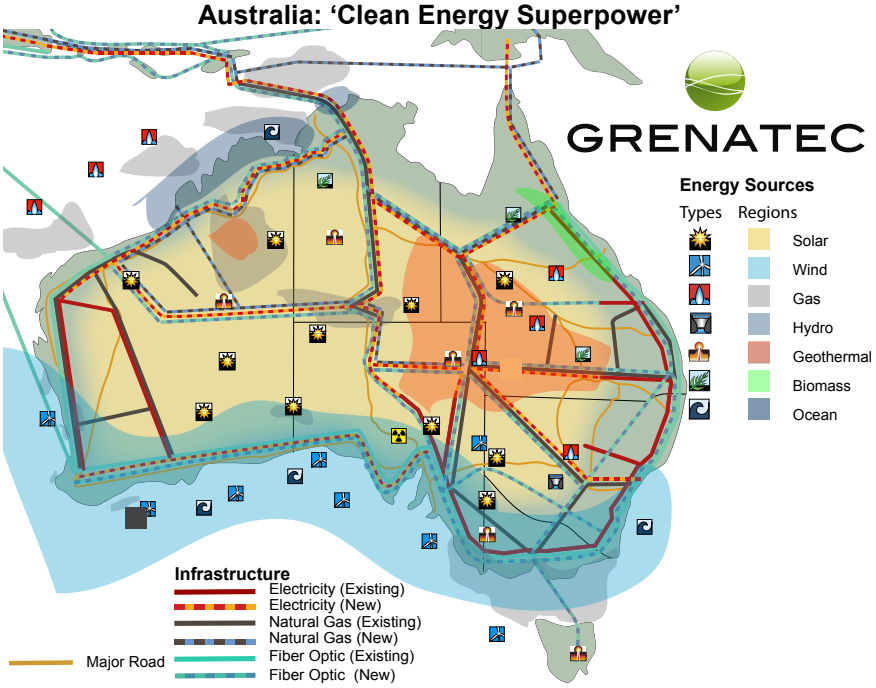
Climate Change Reqiures Different Infrastructure

***"The Australian energy market** is a series of regional markets with **limited interconnectedness and ineffective market-based pricing** for network services due to poor market design."*
"A Report to the Council of Australian Governments,"
Infrastructure Australia,
2008

In *Pan-Asian Energy Infrastructure* we outline how -- by applying orthodox economics and using infrastructure ideas largely *already lofted by industry* -- **Australia can build a continent-spanning infrastructure** comprised of bundled HVDC power lines, natural gas pipelines and fiber optic cables.

Australia: 'Clean Energy Superpower'



Connected to Asia over bundled optical fiber, HVDC and natural gas pipelines, Australia could be a regional 'clean energy superpower.'

"In Australia, you have the ability to construct an Australian super-grid** that will transmit that solar and wind and geothermal power straight to the cities . . . **and in the process create lots of good new jobs."
Al Gore
Vice President,
United States
(1993-2000)

This domestic infrastructure would be the southern terminus of a similar bundled HVDC/natural gas/fiber optic **infrastructure stretching all the way to China.**

Along the way it **would connect with such existing planned regional infrastructure projects** as the *Trans-ASEAN Gas Pipeline, the Trans-ASEAN Electricity Grid,* Indonesia's *Palapa Ring* fiber optic project, China's *Fiber Optic City* telecommunications program and the plans China has for nearly three-dozen long-distance, high-capacity HVDC projects across its own terrain.

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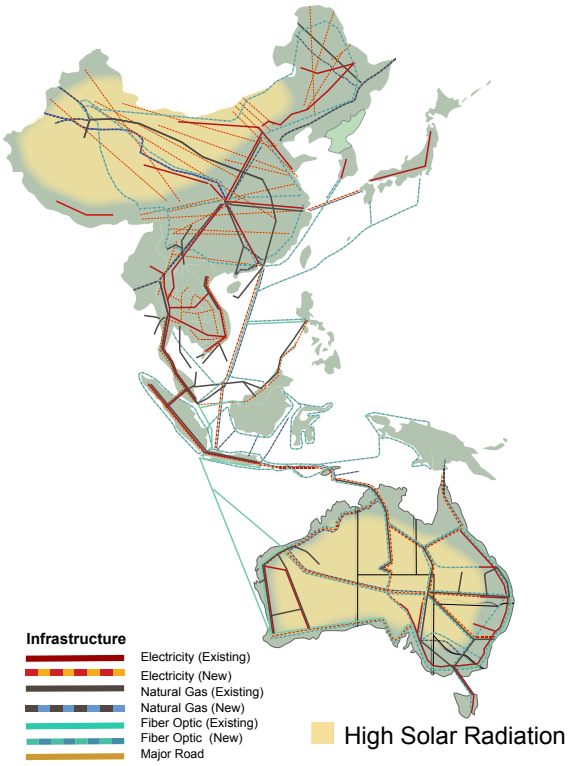
*"The impacts of **climate change** on the **infrastructure** sector are significant because:*
*– **infrastructure is interconnected** — impacts on one infrastructure sector are likely to have impacts on other infrastructure sectors*
*– **some infrastructure is critical** — if it were rendered unavailable for an extended period, there would be a significant impact on the wellbeing of the community*
*– **infrastructure assets tend to be long lived.***
"Barriers to Effective Climate Change Adaptation,'" Productivity Commission, Australia, 2012

A Pan-Asian Energy Infrastructure



A Pan-Asian Energy Infrastructure could stretch from Australia to China. It would combine High-Voltage Direct Current power lines, natural gas pipelines and fiber optic cables.

All of the above is outlined in our report *Pan-Asian Energy Infrastructure.* This infrastructure would address the various 'failures'you outline in your report. We summarize them below.

Market Failures
Behavioural Barriers

Market failures and behavioral barriers are interlinked. **If market failures are fixed, behavioural barriers similarly are fixed.**

The single most important market failure requiring fixing is **pricing carbon.** Climate change is the accumulated result of this two-century long market failure. **Once carbon is priced** (and protected from repeal) **investment can/will flow** into low carbon sources delivered over new infrastructure like that described above.

Recycled carbon tax monies can help fund one or both of these -- of which infrastructure is the more important. That's because lack of acces to infrastructure itself is a market failure preventing the advancement of the renewables industry.

Once the 'chicken or egg' dilemma of new infrastructure is taken care of, new energy sources can become more accessible to consumers who can migrate as buyers between preferred carbon-adjusted energy sources.

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This removes behavioral barriers by giving consumers choice. This would replace ‘take it or leave it’ packages thrust upon them by retailers.

The bottom line lies in pricing the carbon and creating the network. Positive externalities will flow from that.

Australia has already taken the step toward pricing the carbon. **The next step lies in creating the network.** This is already underway with the *National Broadband Network (NBN).*

Why high-voltage DC power lines and natural gas aren’t being laid alongside the *NBN* is a mystery to us here at *Grenatec.*

Needless to say, **the competition-enhancing ‘network effect’ of bundling this infrastructure would be huge.**

Among other things, it would overcome the market failure of excessive regionalised energy pricing in Australia -- which practically makes different state markets in Australia behave as if they were different *countries.*

Regulatory Barriers
Governance and institutionsl barriers

Regulatory, governance and institutional barriers now lie in the way of making the needed changes.

For instance, **many new bits of infrastructure (power lines) must justify their investment on a ‘stand-alone’ basis.** That is, a piece of infrastructure must show it turns a profit by itself. This tends to undervalue the less arithmetically-tangible, but nontheless highly-valuable ‘network effects.’

Other barriers involve **the need for greater cross-border integration of energy networks.** In this respect, the *ASEAN* countries and, to a lesser extent, the currently politically-troubled *European Union* are in the lead.

Both clearly understand the net present value positive sum of greater cross-border energy market integration.

All of the above are discussed in greater detail in *Pan-Asian Energy Infrastructure.*

Sincerely,

Stewart Taggart

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