The Energy Centre Quarterly Report
February 2010
Summary report for discussion at the meeting of the Energy Education Trust, 12 February 2010.

Basil Sharp, director of The Energy Centre in the Department of Economics at The University of Auckland.

It is my pleasure to provide the following summary of activities since 26 November 2009:

1. Promotion activity
   A number of meetings have been held with the Business School’s Advancement team and Bill Thurston. As requested we have contacted Genesis regarding further support for the Centre. Contact with the University’s representative in Wellington has led to a programme being developed for promoting the Centre and seeking closer engagement with both the industry and government. Basil Sharp has met with the former CEO of NZTE, who is seeking to arrange meetings with John Crawford, incoming deputy secretary of the treasury responsible for energy SOEs, and the Right Hon. Hugh Templeton who apparently has a keen interest in energy.

2. Transport research
   The Upper North Island Transport Study (UNITS) group, incorporating The Energy Centre, The Supply Chain Management Group (based in the Department of Information and Systems Management), the Faculty of Engineering and the Department of Geography, met in December to map out a work programme for the summer. A student was hired to undertake a review of publications and write a report outlining research methods and results. This preliminary screening should be complete by the end of February.

   Summer Scholarship
   Basil Sharp obtained a Business School Summer Scholarship, about integrating private electric vehicles into the transportation fleet, for Alexander Yap. Alex will be entering the Department’s postgraduate programme in 2010. The summer project focuses on the economics of electric vehicles, market potential and implications for electricity demand.

   Mark Greer (visiting professor from New York) has started a research project on the economics of electric vehicles in the New York electricity system. This should provide a good basis for comparison with Alex Yap’s project.

3. Energy research
   Rob Kirkpatrick has had early conversations with NZTE on New Zealand biofuels, which is in the very early stages.

   We met with Fonterra at the end of 2009 to discuss future energy supply scenario work. A plan of work has not emerged to date.

   Bart van Campen and Rob Kirkpatrick are continuing their research into New Zealand’s gas market.

   David Young, with Tony Downward and Golbon Zakeri, submitted our paper ‘Swapping Generators’ Assets: Market Salvation or Wishful Thinking?’ to the International Association of Energy Economist’s The Energy Journal. This paper contains a theoretical analysis of asset swapping amongst generators, along with a specific case study to the proposed changes in New Zealand. In the coming year, the team intends to analyse some of the other intended changes to the New Zealand market, possibly starting with a look at the idea of ‘virtual asset swaps’.

   Summer Scholarships
   Basil Sharp obtained a Business School Summer Scholarship, about New Zealand’s forestry opportunities in the transition to a low carbon economy, for Karla Gardner. Karla will be entering the Department’s postgraduate programme in 2010. The summer project focuses on the economics of forestry within the context of government policy.

   Steve Poletti offered Robbie Turner a summer scholarship funded by the Centre aimed at...
looking at the options to improve New Zealand’s dry year electrical security where the present market is unsatisfactory.

Erwann Sabai obtained two Business School scholarships related to energy research. Anton Samoilenko has started analysing data on different international electricity markets. Michael Harte is collecting and analysing data on European Carbon Market’s as a preparation for analysing/comparing with the New Zealand Emissions Trading Scheme once it comes online in the second half of 2010.

4. Advisory group

The first meeting of the advisory group was held at the Business School on Friday 11 December. This was a most useful meeting at which participants raised and discussed research and policy questions that the Centre might focus on. Notes from the meeting are appended. Bryan Mogridge will chair the Advisory group when it next meets on Tuesday 30 March 2010.

5. Summer School in Energy Economics

The first Summer School in Energy Economics will run from Monday 15 February through Friday 19 February 2010 (Appendix B). Around 15 participants are attending, including two from the University of Otago’s Energy Centre.

6. Pacific Economic Co-operation Commission (PECC)

The PECC 2009 seminar, The Water Energy Nexus, was held at the Business School from 8 December 2009 to 10 December 2009 (Appendix C). The seminar was financed by the French Government, Veolia Water, and New Zealand PECC. Participants came from a wide range of economies, including China, US, Chile, France, New Caledonia, and Fiji. From the local industry, we had presentations by William Meek (Mighty River Power), Dr Stuart Simmons (Geothermal Institute) and John Huckerby (Aotearoa Wave and Tidal Energy Association).

7. Conferences and workshops

Basil Sharp, Future of clean energy – developments and trends, Clean Energy Summit, December 1 to 2, Auckland.

8. Publications and reports

Appendix A:

Notes on: The Energy Centre Advisory Group meeting Friday 11 December 2009

In attendance
Peter Clark (ARTA), Simon Lawrence (MED), William Meek (MRP), Bryan Mogridge (EETNZ), Greg Visser (Solid), Peter Wilson (Vector), Greg Whittred (The University of Auckland), Bryce Hool (The University of Auckland), Basil Sharp (The University of Auckland).

General comments
• Break research programme into short, medium and long term projects.
• Evidence based research, with a commercial focus, that feeds into policy.
• Broad scope for research. For example, energy-food-water triangle.
• Access to capital to develop natural resources: PP partnerships, mobilising capital for development, foreign investment.

Electricity
• Impacts of new technology on the sector; eg, PV, incorporating wind, geothermal; bringing overseas experience into New Zealand.
• Demand side management, smart meters, consumer behaviour.
• Prepare think pieces with commercial relevance.
• Problems of pricing. For example, challenge arising from fixed line charges given reductions in electricity use (from increased solar water heating).

Fuels
• Incentives for oil and gas discovery; what might the sector look like if there is a major find?
• Crown minerals policy: issues around royalties.
• New Zealand’s transport mix/fuels/options.
• Market and cost of alternative fuels, coal, gas.

Transport
• In Auckland expect growth from 3.2 million person trips per year to 5.6 million by 2050. Planned network complete by 2020 and will not cope with growth.
• Management of demand, pricing, PT.
• Investment in rapid transport – rail.
• Electric vehicles, technological change.
• Releasing economic energy through improved infrastructure.
• Urban form: relation with transportation.

Extension
• Annual energy forum.

Next meeting: Tuesday 30 March 2010, Bryan Mogridge to chair.
## Appendix B: Summer School in Energy Economics timetable

**15 to 19 February 2010**

<table>
<thead>
<tr>
<th>Time</th>
<th>15 February</th>
<th>16 February</th>
<th>17 February</th>
<th>18 February</th>
<th>19 February</th>
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<tbody>
<tr>
<td>9-9.15am</td>
<td>Welcome (Sharp)</td>
<td>Introduction to transport planning and modelling (Wang)</td>
<td>Electricity market models (Young)</td>
<td>Simulation game electricity market (Young)</td>
<td>Energy and environmental policies New Zealand and abroad (Sharp)</td>
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<tr>
<td>9.15-10.30am</td>
<td>Introduction to economics of natural resources and energy (Sharp)</td>
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<tr>
<td>10.30-10.45am</td>
<td>Coffee break</td>
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<tr>
<td>10.45am-12pm</td>
<td>Introduction to transport economics (Wang)</td>
<td>World oil and gas markets: Peak oil and energy security (Poletti and Kirkpatrick)</td>
<td>Issues in market modelling: Vertical integration, forward contracts, supply security (Young)</td>
<td>Simulation game electricity market (Young)</td>
<td>Energy and environmental policies New Zealand and abroad (Sharp)</td>
</tr>
<tr>
<td>1-2.15pm</td>
<td>Sustainability in transport (Wang)</td>
<td>Electricity markets: Regulation and competition (Poletti)</td>
<td>New Zealand electricity and gas market (van Campen)</td>
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<tr>
<td>2.15-2.30pm</td>
<td>Coffee break</td>
<td>Coffee break</td>
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<tr>
<td>2.30-4pm</td>
<td>Auckland transport challenges and round-table discussion (Peter Clark)</td>
<td>Carbon markets: Uncertainty and investment (Poletti)</td>
<td>Emerging energy technologies, resources and potential for New Zealand energy future (to be confirmed)</td>
<td>Discussion Forum: presentation by student groups and discussion with panel</td>
<td>Drinks and nibbles with forum participants</td>
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<tr>
<td>4-5pm</td>
<td>Drinks and nibbles with energy PhDs, staff and researchers at The University of Auckland</td>
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### Lunch

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**Notes:**
- Field visit to Southdown plant and trading room (van Campen and Collet)
- Discussion Forum: presentation by student groups and discussion with panel
Appendix C:

A PECC INTERNATIONAL PROJECT FOR 2009-2010
Jointly organised by FPTPEC and NZPEC

Towards energy autonomous public utilities infrastructure: The water energy nexus
8 to 10 December 2009, The University of Auckland, New Zealand.
Venue: Owen G Glenn Building, 12 Grafton Road, Auckland.

Day One, Tuesday 8 December

8-9am  Registration
9–9.15am  Welcoming remarks: Professor Coral Ingley, Chair NZPECC
9.15–10am  A New Zealand perspective: The role of electricity and likely demand; supply from alternative technologies. Basil Sharp, The University of Auckland
10-10.30am  Coffee break
10.30-12.30pm  Session 1: Towards a better management of energy for water and water for energy
Session Chair: Professor Coral Ingley
A)  New perspectives for a better management of the water energy nexus: Stocktaking analysis of existing available renewable energies and their potential economic development.
1)  10.30–11.15am: The EU perspective: Introduction to the EU climate and energy package. Denis Fourmeau, EU delegation to China.
2)  11.15–12.30pm: Opportunities for renewable and carbon free energies. Henri Boyé, French Ministry of Ecology, Energy, Sustainable Development, and Oceans; Member of the Permanent Council for Sustainable Development.
General discussion

12.30-1.30pm  Lunch
1.30-3pm  Afternoon session
Chair: Denis McNamara, Simpson Grierson Law
Vice chair NZPECC
B)  How to best satisfy energy needs, reduce energy consumption, increase the use of renewable energies and control greenhouse gas emissions; a regional approach
1)  1.30–2pm: Case study on China: Investment in water and energy supply, by Pr. Wu Jisong, Dean of the School of Economics and Management of Beijing University. Competing use of water for energy and water for agriculture/irrigation. The development of renewable energies.
2)  2–2.30pm: The EU/China co-operation on water and energy: Present and future demand for energy in China; prospects for renewable energies. Denis Fourmeau, adviser to the EU delegation, Beijing.
3)  2.30–3pm: The use of renewable technologies (wind, solar, desalination) to produce clean water with a view to limiting transborder flows of clean water. The California/Colorado case, by Pr. Jim Haw, Director of the USC’s interdisciplinary Environmental Studies Programme.
3-3.30pm  Coffee break
C)  The governance approach to access to water and water for energy.
1)  3.30–4pm: Towards a good governance approach in water management. Dr Coral Ingley, Auckland University of Technology.
2)  4–4.30pm: Indigenous rights for water management. Cases from Chile, Viviane Blanlot.
3)  4.30–5pm: International trade. Dr Rob Scollay, The University of Auckland.
General discussion

5pm  End of session
Evening  Dinner offered by NZPECC at Harbourside restaurant
Day Two, Wednesday 9 December

9-12.30pm  Session 2: Perspectives on energy and water.
            Chair: Professor Basil Sharp

Distributing, treating and using water requires substantial amounts of energy; similarly, producing energy takes substantial amounts of water. The two sectors should explore the possibility to assess the “water footprint” on energy and the “energy footprint” on water, including in terms of quality.

Introduction to the session

1) 9.9.20am: The water-food-energy triangle. Professor Sharp, The University of Auckland.
2) 9.20-9.40am: How to get the best mix between water for energy and energy for water. Yves Cousquer, Senior Adviser to the Minister for Sustainable development, Paris, and senior adviser to the Paristech Chair (Paris Institute of Technology).

A) The energy footprint in the water sector.
3) 9.40-10am: Energy use for production and distribution of water, and wastewater treatment. Henri Boyé, MEEDDAT.
4) 10-10.20am: Production of drinking water production from freshwater resources, the energy footprint in the Pacific Islands. Marc Overmars, SOPAC.

10.20-10.40am  Coffee break

6) 11-11.20am: California: An example of water conflicts over urban use, agriculture, and ecosystem protection. Pr. Jim Haw, Director of the USC's interdisciplinary Environmental Studies Programme.

11.40am-12.30pm  Round-table discussion on the energy footprint with the speakers:
                    Key points to be addressed and best practices to be retained.
                    Moderator: Yves Cousquer, senior adviser to the Minister of Sustainable Development, Paris.

12.30-1.30pm  Lunch

1.30-5pm  Afternoon session
            Chair: Professor Jim Haw

B) The water footprint in the energy sector: Water consumption for energy production and distribution.
1) 1.30-2pm: Geothermal energy. Mighty River Power (New Zealand), William Meek.
2) 2-2.30pm: Nuclear energy: The use of water for cooling. Henri Boyé, MEEDDAT.
3) 2.30-3pm: The impact of energy production on water resources in China and potential conflicts over water uses. Denis Fourmeau, adviser to the EU delegation to China.

3-3.15pm  Coffee break

4) 3.15-3.35pm: Upstream control over water sources for securing water and electricity supply: Impact of hydroelectric dams and plants on downstream access to water. Pr. Wu Jisong, Dean of the School of Economics and Management, Beijing University.
5) 3.35-3.55pm: The Chilean approach: Competing use of water for energy and/or irrigation. Dr Viviane Blanlot, University of Santiago.

4-5pm  Round-table discussion on the water footprint with a special focus on hydroelectricity.
        Moderator: Yves Cousquer, senior adviser to the Minister of Sustainable Development, Paris.

5pm  End of session

7pm  Dinner offered by VEOLIA at “Cin Cin on Quay” by invitation.
Day Three, Thursday 10 December

C) Selection and diffusion of innovative technologies (selected examples worldwide); timeframe diffusion of energy saving available and new renewable technologies in public services.
   Chair and moderator: Marc Overmars

1) 9.45-10am: R&D by multinational operators, a state of the art approach. New Zealand operators, Veolia, Nicolas Renard; Denis Fourmeau, EU delegation to China.

2) 9.45-10pm: State of the geothermal research. Dr Stuart Simmons, The University of Auckland.


4) 10.30-10.50am: Pacific Islands projects development in marine energy. Barbara Vlaeminck, Société de Recherche du Pacifique.

10.50-11.30am Round-table discussion: Support policies by PECC Economies to promote new technologies implemented.

11.30-11.45am Coffee break

11.45am-12.30pm Concluding session
   Chair: Dr Viviane Blanlot, CHILPECC, Jean Luc Le Bideau, Vice Chair FPTPECC.
   Conclusion of the seminar and recommendations for the second seminar. An oral report will be made by the session chairs and moderators.

12.30pm Closing of the seminar/lunch

1.30-5pm Field visit to the Auckland waste water treatment plant and biogas production.

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