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Supporting Paper on Draft Grid Investment Test

Introduction

This paper is to be read as an integral part of the Submission by Energy Information Services Ltd on the Grid Investment Test.

Yours sincerely

Ian Shearer
Director

<p>Who is to be consulted?</p> <p>Sustainable energy service providers and advocates are “affected parties” in Grid Investment</p> <p>They were not consulted in forming the Rulebook or draft GIT test</p> <p>An open process is needed for those parties to be represented in decisions on transmission vs. alternatives</p>	<p>Consultation</p> <p>The 2004 Government Policy Statement¹ says:</p> <p>“6 Where the Commission proposes new regulation or rules, or substantial changes to existing regulations or rules, the Act requires it to follow good processes. These include identification of the main options, assessment of costs and benefits, and consultation with and exposure of its analyses to affected parties. It is also required to satisfy itself that other options (such as information, education and voluntary arrangements) are unlikely to satisfactorily achieve the Government’s objectives.”</p> <p>But the purpose of the Grid Investment Test (GIT) consultation document is given as narrower:²</p> <p>“12. The purpose of this paper is to provide an opportunity for market participants to comment on the draft GIT”</p> <p>The consultation document acknowledges that investment to overcome a transmission constraint will reduce the commercial viability of investments in transmission alternatives to that particular investment. Therefore “affected parties” clearly include sustainable energy providers and advocates.</p> <p>Representatives of end-use energy service providers, including demand side management, energy efficiency and small-scale renewable energy, were not consulted during the drafting and revision of part F³ on the Rulebook, on which the GIT test is based. Neither have they been consulted during the preparation of the draft GIT consultation paper.</p> <p>This lack of representation of providers of small-scale sustainable energy services, including renewable energy, is unacceptable for a public-benefit regulator organisation. The decision processes determined by the Electricity Commission following this consultation will significantly impact on the balance of investment between large-scale supply projects and small-scale, incremental investment in alternatives.⁴ That matter is critical to New Zealand’s progress towards a more sustainable electricity system.</p> <p>Some open process, other than lobbying, is needed to restore proper representation of those parts of electricity sector and competing energy service businesses which are not electricity Market Participants.</p>
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<p>High level issues only</p>	<p>High level issues only</p> <p>This submission will focus on high-level issues, because unless these high level issues are addressed, changes in the details will make little difference to eventual outcomes. Accurate representation of the interests of sustainable energy providers and advocates would require full analysis of the complex documents, and of the workings of the Market Rules as they stand today</p>
<p>As is expected of small-consumer representatives</p>	<p>The Commission appears to prefer that interest groups other than Market Participants focus on high level issues. We note in the Minutes of the Retail Market Advisory Group, 15 September 2004:⁵</p> <p>“General Business. Consumer Representation During the meeting a member brought the issue of consumer representation to the RMAGs attention. The member noted that Retailer and Network companies have designated people to represent them on groups such as the RMAG. They also have designated people whose job it is to make submissions. It was noted that consumer representatives lack the resources to keep up to date and make submissions on issues they feel strongly about. A member commented that consumer representatives on the RMAG should be concerned with one high level question- “how does this benefit the consumer” when addressing all types of issues. (emphasis ours)</p>
<p>The devil is in the detail</p>	<p>Yet the Transmission Advisory Group (TAG) comment on the paper commissioned to propose the Grid Investment Test states:⁶</p> <p>“Members expressed the view that “the devil is in the detail”, and that the paper will be controversial regardless of the approach it adopted.”</p> <p>We conclude that the present truncated consultation process cannot realistically provide the necessary substantive input to the detailed mechanisms for the Grid Investment Test. For that reason, we will not address most of the specific questions in the consultation document.</p>
<p>Our interests must be protected through a different process</p>	<p>This does not mean we do not wish to engage in the “devilish” detail. Providers of energy services, including demand side management and small-scale renewable energy, will need a fair process to ensure their interests are protected during the detailed negotiations amongst Market Participants.</p>
<p>With funding and expert advice</p>	<p>This will require funding and technical advice from experts of the sustainable energy industry’s own choosing. A thorough analysis of the present supply-side strategy needs to be part of that exercise.</p>

<p>First priority is managing electricity demand</p>	<p>Overall strategy: balance needed between increasing supply and reducing demand.</p> <p>The Parliamentary Commissioner for the Environment has a statutory duty to audit the environmental sustainability performance of the industry and the Electricity Commission (in its governance role). He has set as the first priority the managing of growth in electricity demand, by promoting energy efficiency and active demand-side participation in the wholesale market.⁷</p>
<p>Strategies to date have been supply-side driven</p>	<p>The GIT test will be the major driver of the balance of investment between increasing supply and reducing demand. If the first step of the transmission upgrade – a 400 kV line between central Waikato and South Auckland – is approved, it will encourage further investment in remote power generation, and require further investment in local networks. This is a continuation of traditional supply-side strategy.</p> <p>A preference for supply-side solutions has so far been shown by the Minister’s decision to build a “Reserve Generator” at Whirinaki, and to subsidise the gas risk of Genesis’ e3p to enable it to be built immediately. Both stations are remote from main loads and will require augmented transmission investment (also improved fuel supply) to be fully effective.</p>
<p>Interventions will disadvantage the demand side</p>	<p>A major justification for the Reserve Generator decision was the intention to cap spot prices at around 20c/kWh.⁸ This, if effective, will reduce the commercial viability of demand-side alternatives designed to improve security of electricity supply. The new base-load power station for Huntly is designed to create a surplus of generation capacity during the operation of the “normal” market, thus reducing normal as well as peak spot prices.</p>
<p>Balance must be restored</p>	<p>These interventions into both normal and “reserve” markets will disadvantage all demand-side solutions including energy efficiency. (It will also disadvantage other generators whose risks are unsubsidised – leading to a concern that decisions on where to locate either generation or new industrial load will now be driven by regulatory, not commercial, factors.) This could compromise the entire objective of the competitive electricity market.</p> <p>To meet the Parliamentary Commissioner’s published standards, the Electricity Commission should actively facilitate demand-side investments, including small-scale and incremental investments, to restore balance. Alternatively the Commission should facilitate other parties do so in a way that addresses commercial risks (see below).</p>

<p>End users' actions determine shortage likelihood</p> <p>End users pay all investment costs</p> <p>They could contribute to reliability</p> <p>Reliability needs of industrial and domestic users are different</p> <p>Switching systems and tariffs need to be developed.</p>	<p>The End User: the key to actual wholesale prices and reliability</p> <p>The agents who uniquely determine the need for transmission investment – and also investment in local networks and generation – are those who flick the switches on and off. They determine, at each instant, how many generators need to run overall, or where network constraints will occur at each location – or (as can never be wholly avoided) where supply will fail.</p> <p>End users pay for all investment, whether up front for efficiency in their own homes and businesses, or through their power bills for the central provision of generation and network services.</p> <p>End users themselves invest in backup systems to the degree they expect supply failures. These backup systems could be called on in cases of impending shortage, whether of dry-year primary energy, or peak generation, transmission or local network capacity. This would require tariffs which genuinely represent the whole system savings offered by demand response to impending constraints. “Innovative retail tariffs” to facilitate these issues must be rapidly developed by the Retail Market Advisory Group.⁹</p> <p>Industrial users generally require a large proportion of their load to have high reliability standards. In contrast many domestic consumers have alternative heating and even cooking options. These could be used on request to greatly reduce the cost of meeting peak loads, or even meeting dry-year supply requirements. Together with “always-on” peak reduction techniques such as compact fluorescent lights, domestic response during periods of high power supply costs could reduce whole-system costs and CO₂ emissions.¹⁰</p> <p>To realise this potential, substantial restoration of past ripple control hardware is needed. Development is needed also of new enabling technologies and mechanisms for both automated and user-driven switching of chosen appliances. Suitable tariffs are needed to convert this potential into market reality. This will be discussed in greater detail in the submission to come on transmission pricing methodology.</p>
<p>“Transmission alternatives” are mainly generators?</p> <p>Demand side alternatives are incremental</p>	<p>Definition and treatment of transmission alternatives</p> <p>In the GIT test and other papers, “transmission alternatives” appear to refer mainly to generation proposals on the constrained side of a network constraint. Demand-side investments that reduce peak demands are barely mentioned, despite their prominence in the Government Policy Statement, and in the PCE audit framework.</p> <p>Demand-side transmission alternatives are almost always, perhaps always, incremental. According to the proposed Grid Investment Test, it is clear that only “lumpy” investments would be considered for funding.¹¹ Small-scale investments, whether in demand management or renewable energy supply which reduce peaks (e.g. domestic wood burning), would be considered a part of the “normal” market. They would therefore not receive “regulated</p>

<p>and proposals are self-funded unlike Transpower's</p>	<p>funding”, introducing a bias in favour of lumpy transmission investment which would need to be balanced by another specific new mechanism.</p> <p>Bias is increased because Transpower already receives “regulated funding” through the interim arrangements for the Commission to approve expenditure in preparing its upgrade proposals.¹²</p>
<p>Transpower upgrades lead to further supply expenses</p>	<p>And to realise the economic benefits of Transpower upgrades, further investment is needed in the rest of the supply-side chain – fuel supply for new generators (including subsidised gas exploration), the generators themselves, and in some cases (not Auckland CBD) the expansion of distribution networks. Delivered electricity includes all those costs.</p>
<p>Scenario treatment of DSM dilutes their potential</p>	<p>Demand-side investments are to be compared with the proposed transmission upgrade by calculating the costs and benefits of each within each of five scenarios for future market development.¹³</p> <p style="text-align: center;">“Expected net market benefit is defined as the probability-weighted average of the results of the market development scenarios.”</p> <p>Given that strong demand side involvement is unlikely to be factored adequately into most of the scenarios, the potential for DSM seems likely to be diluted out of contention. It would thus not seriously affect the prospects for approval of transmission upgrades.</p>
<p>Scenarios will be based on past trends.</p>	<p>The scenarios used will be based on past trends not dissimilar to those used by the Ministry of Economic Development in preparing its “Energy Outlook.”¹⁴ Consultation on the scenarios and their assumptions will be called for in March when the first Statement of Opportunities (for transmission alternatives) is released. .</p>
<p>Policy-oriented modelling can show likely emergent properties of systems</p>	<p>In fact, the potential for demand-side alternatives to defer transmission investment will not be recognised until suitable policy-oriented modelling is developed and applied. Scenario based methodologies indicate <u>potential</u> uptake only, whereas simulation based methodologies indicate <u>likely</u> uptake under particular policy choices. In particular, they can suggest how different methods of influencing individual decisions can give rise to system emergent properties to a particular end (e.g. reduced CO₂ emissions or increased reliability of electricity supply).</p>
<p>which is a priority for policy development</p>	<p>Although policy-oriented modelling cannot be expected to be ready in time for early applications of the GIT, we consider development of such techniques to be a priority.</p>

<p>Regulatory intervention heads NZ down a slippery slope -</p> <p>- which could seriously undermine the present wholesale market</p> <p>One view: only large and lumpy transmission alternatives should be funded through regulation</p> <p>Another view: transmission alternatives should be fully considered and assisted where necessary</p> <p>The debate as presented ignores existing distortions from ad-hoc decisions.</p>	<p>Investment: the slippery slope</p> <p>Bill Hogan’s memo to the Commission on the GIT¹⁵ notes that markets in New Zealand as well as essentially all other restructured electricity systems have proved unable to facilitate all investments needed for a reliable supply of electricity. But any regulatory intervention moves the sector towards a “slippery slope”, where “regulatory selection and subsidies” drive investment decisions. The “pinnacle” of an electricity free market is where all costs are externalised, and all players are unsubsidised and compete equally.</p> <p>The Transmission Advisory Group described this as the “minimalist view” -¹⁶</p> <p>The minimalist view argues that regulatory funding of transmission alternatives gives rise to fundamental concerns about a ‘slippery slope’ that will eventually result in most generation investment decisions being made by the Commission. This is seen by some in the group as seriously undermining the continuation of the wholesale market as we know it today, essentially heralding a return to pre-1996 days. (emphasis ours)</p> <p>Hogan considers that the GIT test can avoid the slippery slope, by funding only large and lumpy transmission alternatives [namely large power stations]. The obvious rule would be that in addition to meeting an overall cost-benefit test, the investment would have to have the inherent characteristic of being both large and lumpy. Here “large” would mean big enough so that the investment would make a material change in market prices. And “lumpy” would mean a technological design that is for practical purposes an all or nothing choice. We could elaborate on these ideas, but the principle is clear.</p> <p>In contrast, a case for funding alternatives is made in Saha International’s report on transmission alternatives:¹⁷</p> <p>In order to ensure that the projects that provide the greatest benefit to the electricity system are developed, the implementation of the framework must fully consider transmission alternatives. ... To be effective, the disclosure information (statement of opportunities and grid upgrade plan) may need to practically assist the participants identify and evaluate transmission alternatives.</p> <p>The report identifies difficulties that proponents of transmission alternatives will have in responding to the grid investment Statement of Opportunities, and suggests the Commission take an active part in overcoming the difficulties.</p> <p>Neither report mentions the effect of Government’s recent ad-hoc decisions to build Whirinaki and assure the commercial success of e3p.¹⁸ But informal conversations make it clear that there is a widespread industry view that New Zealand is far down the slippery slope today. Some people wonder whether any investment not approved by regulators will occur in today’s risk-averse subsidised commercial environment.</p>
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	<p>For sustainable energy advocates and practitioners, the growing subsidisation of supply-side commercial risks is creating new and unsupportable risks to their own businesses.</p>
<p>Proposed grid upgrades present a risk to investments in transmission alternatives (including demand side)</p> <p>Demand side investments need a stable investment climate</p> <p>Risks to small-scale investments must be managed no less than those of large-scale ones</p>	<p>Risks: transmission vs alternatives</p> <p>The draft GIT paper acknowledges that the commercial viability of transmission alternatives depends on whether or not transmission constraints are relieved by grid upgrades:¹⁹</p> <p style="padding-left: 40px;">The clear implication of the current rules is that the Commission can approve or reject Transpower’s proposed grid investments, but not transmission alternatives. In broad terms, though, approving or rejecting Transpower’s grid investment proposals amounts to rejecting or approving transmission alternatives that compete with that grid investment, because transmission alternatives are only likely to be commercially viable if grid investment does not proceed.</p> <p>Sustainable energy service providers face a very volatile environment at present. Boom-bust events during and after the shortages of 1992, 2001 and 2003 led in many cases to layoffs in small sustainable energy businesses once a return to adequacy or surplus was confirmed. A more stable business environment for small-scale energy service companies is necessary if they are to contribute to reduction of costs both for the electricity sector and the New Zealand economy as a whole.</p> <p>If regulatory decisions end up driving transmission investment, which in turn drives location of new generation and energy-intensive industry, then some means of regulatory decision-making needs to drive investment in cost-effective demand side management. This mechanism must reduce the risks of small-scale developments to a degree commensurate with those of the “large and lumpy” investments that are already protected by regulated funding.</p>
<p>Forecasted peak demand for Auckland is 2181 MW by 2010</p>	<p>Potential contribution of demand-side to transmission investment deferral</p> <p>Transpower’s Request for Information on its first proposed upgrade, the 400 kV line from Whakamaru to Auckland, is based on a forecasted growth in peak demand of approximately 12% by to 2181 MW by 2010.²⁰</p> <p>To address the expected transmission constraint “may require up to 100 MW [transmission] capacity to be supplied from winter 2010”.</p> <p>A recent report by Charles River Associates to Vector Networks²¹ says, “In principle, demand management can provide significant economic benefits by reducing the need for capital spending on generation,</p>

<p>Load control could reduce that by 300 MW -</p> <p>- if appropriate tariffs were available</p> <p>International experience confirms DSM can provide cost effective alternatives to network expansion</p> <p>But competitive markets create many barriers to DSM.</p>	<p>transmission and distribution equipment, and/or reduced reliance on inefficient technologies to meet peak demands. Sinclair Knight Mertz estimates that around 800 to 1000MW of load control may be available during peak demand periods, which is around 14% of peak customer load.”</p> <p>Assuming the 800 to 1000 MW is a New Zealand-wide figure, we note that if load control reduces Auckland peak demand by 14% in 2010, approximately 300 MW could be taken off the forecasted peak demand of 2181 MW. (Such averaging is completely inappropriate; however it is the detail that matters – the inescapable conclusion is that there is more than enough load control opportunity to do the job.)</p> <p>However at present load control does not benefit either retailers or distributors, so this opportunity will not be realised without significant change to the present incentive structure²² – in particular tariffs that encourage electricity demand to respond to actual half-hourly costs.</p> <p>Passive energy efficiency investments – notably compact fluorescent lights – could add further to demand reductions in winter – Auckland does not yet have a summer peak, though that is likely to come eventually through growth in air conditioning.</p> <p>International experience confirms the potential of demand side management to provide cost-effective alternatives to network expansion.²³ The IEA is at the forefront of research and development on demand-side management (DSM) in restructured electricity systems, having convened some fifteen international task groups on these issues since the late 1990s. The most recent is Task XV, Network-driven DSM, the first newsletter of which notes:²⁴</p> <p>“DSM measures . . . can be used to relieve network constraints, whether the constraints are time related (eg occurring at times of the network system peak) or location-related (eg associated with particular lines or substations) or both. Such network-driven DSM measures are often more cost-effective and may also have lower environmental impacts than network augmentation (i.e. building poles, wires and substations).”</p> <p>However there are many barriers to realising that potential – especially in countries that have commercialised, privatised, unbundled, and introduced retail competition to their electricity markets. New Zealand has introduced all four types of reforms.</p> <p>“Competition increases the effects of such economically related barriers as: “excess capacity”, “low cost of energy”, “limited investment capital”, “high initial cost”, “short-term perspective”, “customer instability”, and “pricing barriers”. Any activities that increase risk (or are perceived as increasing risk) or negatively affect profits are likely to be rejected.²⁵</p>
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	The article quoted goes on to list potential advantages of competitive markets in promoting DSM, particularly cost-reflective pricing. However none of them have been realised in New Zealand to date.
<p>Transmission planning is power planning</p> <p>The potential of DSM to defer costs and impacts of transmission upgrades cannot be realised under the proposed regulatory system</p> <p>Ad hoc decisions already compromise DSM and could undermine the whole electricity market.</p> <p>Consultation to date has failed DSM providers.</p> <p>A separate process is necessary to remove bias.</p>	<p>Conclusion</p> <p>Decisions to upgrade transmission will determine the commercial viability and location of large-scale generation, and of small-scale alternatives including demand-side management and renewable energy. This is power planning by another name.</p> <p>Demand side management has the potential to significantly defer transmission upgrades such as the proposed upgrade from Whakamaru to Auckland. It would also reduce the escalating environmental impacts, including CO₂ emissions, of the present supply-side strategy.</p> <p>The Grid Investment Test as proposed cannot choose demand-side alternatives over large-scale transmission upgrades and the expansion of supply that would be enabled by the upgrades.</p> <p>Ad-hoc decisions to build a Reserve Generator (Whirinaki) and to subsidise gas risk for the new Genesis power station have already compromised demand side management investments. The market distortions caused by such decisions could so undermine the wholesale electricity market that New Zealand could end up returning to central planning - while paying the high costs of the competitive market.</p> <p>The consultative processes used to date by the Commission have given Market Participants direct input to formal consultation papers, but none from sustainable energy service providers. This has allowed the present supply-side strategy to be confirmed as the market rules evolved. It now allows supply-side thinking to drive the proposed regulatory tests that will determine where new investment takes place.</p> <p>To gain traction, sustainable energy alternatives would appear to require a separate planning and funding process, free of the bias that is evident in the regulatory system we have now.</p>

End Notes:

¹ GOVERNMENT POLICY STATEMENT ON ELECTRICITY GOVERNANCE October 2004,

<http://www.med.govt.nz/ers/electric/governance-gps/final/final.pdf>

² Electricity Commission, Draft Grid Investment Test., September 2004,
<http://www.electricitycommission.govt.nz/develop/transmission/grid-investment-test-consultation-sept04.pdf>

³ Electricity Commission, Electricity Governance Rules, part F: July 2004:
<http://www.electricitycommission.govt.nz/govern/regs/rules-part-f-reg-01-jul-04.pdf>

⁴ ref 2 para 125

⁵ Retail Market Advisory Group, Minutes of 21 July meeting,
<http://www.electricitycommission.govt.nz/advisory/retail/meeting-18-aug-2004/minutes-21-july-04-rmag-meet-18-aug-04.pdf>

⁶ Transmission Advisory Group, Comments on Transmission Issues Papers, 6 Aug 2004
<http://www.electricitycommission.govt.nz/advisory/transmission/tag-comments-on-issues-papers-tag.pdf>

⁷ Parliamentary Commissioner for the Environment, Electricity, Energy and the Environment, Assessment Framework 2004
http://www.pce.govt.nz/reports/allreports/1_877274_14_3.pdf

⁸ Ministry of Economic Development, “Security of Supply” Draft 14 September 2003
<http://www.med.govt.nz/ers/electric/governance-gps/draft/20030914/20030914-05.html>

⁹The Retail Market Advisory Group’s work on innovative retail tariffs was deferred until EECA reviewed the scoping document. “A member noted that overseas studies had shown that pricing incentives had not made people change their electricity consumption and that methods such as providing more visible consumption data were more effective.”
<http://www.electricitycommission.govt.nz/advisory/retail/meeting-18-aug-2004/minutes-21-july-04-rmag-meet-18-aug-04.pdf>

¹⁰ R. Cowart, “Efficient Reliability”, www.raponline.org/Pubs/General/EffReli.pdf

¹¹ ELECTRICITY COMMISSION Consultation Paper, Proposed Guidelines For Transpower’s Pricing Methodology
http://www.electricitycommission.govt.nz/develop/transmission/issues-paper-pricing_method-guidelines-sept04.pdf section 75 ff.

¹² Ref. 2 paragraph 123 ff.

¹³ Ref. 2 paragraph 27

¹⁴ Presentation by Bruce Smith, at New Zealand energy modelling workshop #1 Victoria University 20 October 2004,
www.mcs.vuw.ac.nz/events/EMW
See also Part F Commission Briefings October 2004,
<http://www.electricitycommission.govt.nz/develop/transmission/part-f-commission-briefings-oct-04.pdf>
and Part F Briefings October 2004 – Questions
<http://www.electricitycommission.govt.nz/develop/transmission/part-f-briefings-oct-04-questions.pdf>

¹⁵ MEMORANDUM DATE: June 15, 2004 TO: Dr. Ralph Craven, Transpower NZ Ltd.

FROM: Bill Hogan SUBJ: Transmission Investments and Alternatives
<http://www.electricitycommission.govt.nz/advisory/transmission/reports/hogan-memo-transmission-investment-alt.pdf>

¹⁶ TRANSMISSION ADVISORY GROUP 17 August 2004 Further Comments on Funding Transmission Alternatives
<http://www.electricitycommission.govt.nz/advisory/transmission/funding-transmission-alternatives-tag.pdf>

¹⁷ Saha International, Electricity Commission, Alternatives to Investments in the Transmission Grid, 2 July 2004, Final Report
<http://www.electricitycommission.govt.nz/advisory/transmission/reports/transmission-alternatives.pdf>

¹⁸ The roles of both reserve generation and new baseload generation in improving security of supply is discussed within a comprehensive framework in the report by PA Consulting Group at
<http://www.electricitycommission.govt.nz/advisory/security/preliminary-report.pdf>

¹⁹ Ref. 2, paragraph 125

²⁰ Transpower, Request for Information Paper Alternatives to transmission investment for meeting future electricity supply requirements for Auckland and North Isthmus September 2004. Warning, this document is 3.6 megabytes to download, though only 23 pages and 856 kB on disk.
http://www.transpower.co.nz/notion/share/download.asp?cid=5144&csid=11957&mdid=&file=/upload/notion/sectionimages/11957_rfi-sept-2004.pdf

²¹ Charles River Associates, December 2003 Final Report (to Vector Networks) Not to my knowledge available on internet.

²² Charles River Associates *op. cit.* Section 4.

²³ Website: International Energy Agency Demand-Side Management Programme 'Promoting Energy Efficiency and Demand-Side Management for global sustainable development and for business opportunities' Task XV: Network Driven DSM
<http://dsm.iea.org/NewDSM/Work/Tasks/15/task15.asp>

²⁴ TASK XV NEWSLETTER NO 1 16 July 2004 Operating Agent for Task XV, Dr David J Crossley, Energy Futures Australia Pty
No web reference available. Has been superseded by the new website above.

²⁵ Vine, E. et. Al., "Public policy analysis of energy efficiency and load management in changing electricity businesses" Energy Policy 31 (2003) 405–430