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Mr Rob Hansen
Research Director
Environment and Resources Committee
Parliament House
BRISBANE QLD 4000

Dear Mr Hansen

I refer to your letter of 12 June 2009 to the Chief Executive Officer, Mr Lance Hockridge requesting information on energy efficiency improvements at QR. As this is an operational matter for a number of QR businesses including the corporate Environment Sustainability Strategy Group, Mr Hockridge has asked that I respond to you on his behalf.

I welcome the opportunity to comment on the Committee's Paper No. 1: Inquiry into Energy Efficiency Improvements.

QR is committed to implementing measures to improve energy efficiency therefore, please find attached QR's submission.

If you have any further queries please do not hesitate to contact David Mitchell, Environment Sustainability Specialist, Enterprise Risk Services on 07 3235 2763 or david.mitchell2@qr.com.au.

I trust this information is of assistance.

Yours sincerely

Greg Pringle
Chief Risk Officer
QR Limited

6 August 2009

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Submission #4

QR LIMITED

COMMENTS ON ENVIRONMENT AND RESOURCES COMMITTEE'S *PAPER NO. 1: INQUIRY INTO ENERGY EFFICIENCY IMPROVEMENTS*

August 2009

The views expressed in this document are those of QR Limited and do not necessarily reflect the opinion of the Queensland Government.

Background

QR Limited's (QR) most significant environmental footprint element is our energy use and associated greenhouse gas emissions reported as 13.3PJ in 2007/08.

QR started considering energy efficiency when it became a signatory to the voluntary Greenhouse Challenge Program in 2000. The organisation's efforts were recognised twice in 2002 and 2005 for reducing emissions under the scheme.

QR's approach has been to identify energy efficiency through:
- rollingstock innovation and upgrading;
- enhanced efficiency of train operations and asset utilisation; and
- infrastructure development and upgrading.

Overall QR comment on the paper

What have been the economic and environmental costs and benefits arising from energy efficiency improvements?

Energy efficiency initiatives and benefits for 2008/09 under each of the categories are as follows:

Rollingstock innovation and upgrading

QR has a large fleet of over 700 locomotives across Australia, encompassing diesel, electric and a few steam locomotives.

Some of the efficiency initiatives underway that overlap the reporting period include:
- the newly acquired locomotives (4100 and 5000 class) that meet current US Environmental Protection Agency specifications and are optimised to minimise fuel consumption, oil consumption and exhaust emissions;
- modifications to the 2250 class locomotive engine reduced fuel consumption by 15%; and
- a one-year trial of energy efficient light emitting diode (LED) lighting commenced for a sample of QR's Citytrains and regional travel trains involving external marker and tail lights.

Enhanced efficiency of train operations and asset utilisation

Speed reductions for Clyde class locomotives to power to 80kph and coast to 90kph for freight operations on the North Coast line has resulted in approximately 10% improvement in fuel per trip between Brisbane and Cairns. It has also improved the engine life for these locomotives.

The 2250 class locomotive was given extra weight (or ballasted) to improve traction on rail along with an updated traction control system further improving efficiency.

Infrastructure development and upgrading

Efficient LED lighting was trialled at Wynnum and Cleveland stations. The trials proved successful with energy savings of approximately 2000 kwh/year. Lighting is reported as having a 15 to20 year life of operation, which saves on maintenance costs.

What have been or are potential barriers and impediments to improved energy efficiency?

Calculation of benefits from energy efficiency in operations is often complicated by a multitude of factors that disguise a full reconciliation and account of benefits. For example load changes, scheduling, driver operation and ambient weather conditions such as a head wind etc all influence the efficiency of train operations.

The interaction of energy efficiency initiatives and other measures that may be less energy efficient but required for operation, can counteract benefit of efficiency measures.

In some instances there may be an unplanned benefit. For example, improvement in the tractive effort of a locomotive by increasing its weight (ballasting) resulted in an improvement in fuel efficiency.

Also changes to operations will influence reconciliation of energy efficiency initiatives. For example, changes to operations in 2008/09 were:

- an 11% increase in the Citytrain footprint due to the introduction of new services; and
- an approximate 5% decrease in freight movement.

As such, the efficiencies reported are generally conservative estimates based on simulated trials but not applied across operations to attempt to establish full benefit.

The cost/resourcing of monitoring and evaluation can be an impediment to fully understanding the benefit of efficiencies. In some cases, the cost of monitoring may consume the benefit of implementing an initiative. This is coupled with the fact that energy benefits in some instances may not have been the focus for an action and so benefits are accepted but not accounted.

The dilemma is that without understanding the benefit derived from initiatives, it makes business cases for future initiatives difficult.

Ideally efficiencies are presented in product specifications such as for new locomotives.

In a number of instances the optimal operation for energy efficiency is not always possible. For example, QR runs a passenger service with service schedule obligations to the Department of Transport and Main Roads (DTMR). This requires that trains run whether they are full or empty. Also, a customers' requirement for delivery of goods on time can affect the optimal train configurations for energy efficiency.

Other barriers can include:
- available capital funds to implement energy efficiency measures;
- capability and availability of resources within the organisation to assess and identify energy efficiency opportunities; and
- buy in from key stakeholders.

From a network infrastructure perspective, there is a close relationship between energy efficiency and both the horizontal/vertical alignments of transport corridors.

For example, a train is more energy efficient where it can accelerate steadily and maintain a constant speed, rather than accelerating and decelerating around corners and over undulating topography. Policy barriers can prevent effective long-term planning for more efficient systems.

What are potential policy options for energy efficiency improvements (with emphasis on initiatives that are cost effective for individual producers and consumers)?

Rail is generally the most energy efficient, land-based form of transport[1] and should be provided for, and promoted in, policy options for energy efficiency.

Intermodal services involve the transfer of containerised freight between truck, train and shipping modes. This is a growing market with a growing carbon footprint. Intermodal rail offers a better solution to long-haul trucking of freight highlighted by statistics such as:
- QR moves one tonne of freight 147 kilometres by rail on just one litre of fuel[2]
- one train in the intermodal service takes the equivalent of 150 trucks off the road.

Rail is also the most energy efficient means of metropolitan passenger services[3]
- QR peak-hour train carries 600 passengers at full capacity, in a six- car train
- for every 1000 people who use public transport, 800 cars are taken off our roads
- by comparison, a passenger on a QR peak-hour train has a carbon footprint per kilometre of 30.3 gC02e compared with 250g C02e if choosing to travel by car.

There is an opportunity to provide for this in the Queensland Office of Climate Change's Climate Change Impact Statement (CCIS), which is currently being developed.

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[1] QR's rail is more energy efficient compared with alternatives for bulk and long haul freight and metropolitan passenger services based on an independent benchmarking report completed in 2007.

[2] Calculation is an average based on total distillate fuel consumption, net tonnes hauled and kilometres travelled for combined bulk and containerised freight transported by rail for the 2007/08 period.

[3] Calculations for passenger services are based on factors and methods presented on the website at http://www.corporate.qr.com.au/environment/Calculator/calculations.asp

A CCIS will be required for every infrastructure project submitted to Cabinet to describe how projects will contribute to Queensland's overall greenhouse and energy use footprint and how they will endeavour to be resilient against expected climate change impacts. The CCIS should allow transparent account of transport options with naturally high energy efficiencies.

In conjunction with this: policy could provide for long-term planning of transport corridor alignments to optimise the energy efficiency of transport systems such as rail. This is not only from an operational energy management perspective (including generating demand for electricity to power trains) but also from a construction sense, with the extent of energy use in establishing cuttings and embankments required.

The recent Auditor-General's report No. 3 on Transport network management and urban congestion (June 2009) identified that managing the transport network needs to be coordinated and integrated to be strategically effective.

In being strategically effective, this means the transport network also delivers on providing maximum energy efficiency. To be strategically effective, we agree a long term vision to planning transport infrastructure needs to be paramount to the State Government's decisions.

The Auditor-General's report stated Department of Main Roads (Main Roads) has good governance systems in place. This was in respect to forward plan outcomes and outputs, programmed development and delivery of investments in the road system. Main Road's governance system is its Road System Manager (RSM).

In doing so, Main Roads has clearly defined statutory authority to identify, secure and deliver the most energy efficient road alignments within the same governance system.

Having such statutory authority to secure road corridors well in-advance of foreseeable land development, land development can be designed with certainty around the transport corridor. As a result, Main Roads can often secure its first preference for state controlled roads with more straight and lower grade alignments, delivering maximum energy efficiency with its infrastructure.

Unfortunately, despite the well-recognised highest energy efficiency rail offers as a transport mode, the same seamless integration that state controlled roads benefit from is far less evident across agencies in securing and delivering rail infrastructure.

The limited presence of an equivalent strategic governance system for securing rail infrastructure often means we are constrained with having to place rail corridors through already developed areas.

To go through such already developed areas, it increases the need for tight curves and steeper vertical gradients to minimise the extent of costly land acquisition. Both tight curves and steeper vertical gradients reduce operational speeds and thus, placing barriers for rail to achieve the maximum energy efficiency in its design and operation.

QR is supportive of any policy framework that provides a more level playing-field in securing such transport infrastructure corridors well in advance of construction.

As a way of removing such barriers faced in delivering energy efficiencies with rail infrastructure, we are encouraged by the Auditor-General's key recommendation about enhancing integration, embedding genuine collaboration and more important, leveraging on synergies that exist in the roles of the former departments.

QR Network Pty Ltd would therefore be willing to assist DTMR to identify synergies and gaps between the Road System Manager and equivalent rail governance systems.

We believe enhancing such synergies and minimising such gaps in our infrastructure delivery processes will be of great assistance in achieving the highest energy efficiency in our future operations.

What role do Commonwealth Government Initiatives, including the proposed Carbon Pollution Reduction Scheme (CPRS) play in encouraging energy efficiency?

As earlier advised, QR started considering energy efficiency when it became a signatory to the voluntary Greenhouse Challenge Program in 2000. The organisation's efforts were recognised twice in 2002 and 2005 for reducing emissions under the scheme.

Improvements in efficiency over the years, has been through practically maximising unused capacity on train services.

Operationally, service efficiency was the primary driver behind the early changes rather than a focus on greenhouse emissions. This is changing with awareness about the issue and the expected cost liability of carbon.

It is too early to comment on the role the proposed Carbon Pollution Reduction Scheme (CPRS) has had on encouraging energy efficiency but it has supported raising further awareness around carbon risk within QR.

The *Commonwealth Energy Efficiency Opportunities Act 2006* has mandated that energy efficiency be addressed in our major uses. QR is currently, or will be looking at engineering and freight management improves in our freight services over time.

The *National Greenhouse and Energy Reporting Act 2007* is a data collection and reporting process, which will provide the business with ongoing understanding of its energy use and related greenhouse gas emissions. This will enable better decisions to be made on energy and emission cost savings and best practice benchmarking against similar businesses.