WGTP – WITNESS STATEMENT – Professor Peter M. Graham

WEST GATE TUNNEL PROJECT INQUIRY AND ADVISORY COMMITTEE

4 September, 2017

EXPERT WITNESS STATEMENT

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QUALIFICATIONS

Doctor of Philosophy (Architecture) University of New South Wales
Master of Applied Science by Research (Sustainable Construction) RMIT University
Graduate Certificate Tertiary Teaching & Learning RMIT University
Bachelor of Building Construction Management (Distinction) RMIT University

- **A statement Identifying the expert's area of expertise to make the report**

Peter Graham is Professor – Smart Low Carbon Cities and Deputy Director of the Swinburne Centre for Urban Transitions. He is also Director of the Global Buildings Performance Network (www.gbpn.org), an international network of experts dedicated to achieving the mitigation of greenhouse gas emissions from the buildings sector and is a Board member of the Buildings Performance Institute Europe (www.bpie.eu). He has more than 20 years of experience in international advocacy, research and education in sustainable building design, construction, evaluation and policy. Previously he has been the Technical Advisor and past Coordinator of the United Nations Environment Programme's (UNEP) Sustainable Buildings and Climate Initiative (www.unep.org/sbci) where he developed and managed many of UNEP's key research projects and publications in the building sector. Recently he has supported international collaboration to improve building energy codes for the G20 and Major Economies Forum, and was a contributing author to Intergovernmental Panel on Climate Change, Assessment Report 5 (IPCC AR5) Working Group 3 Buildings Chapter, the Global Energy Assessment, and UNEP Emissions Gap Report. He also led the content development, organizational strategy and implementation planning for the Paris COP21 Buildings Day and Global Alliance for Buildings and Construction. More info can be found at: https://fr.linkedin.com/in/peter-graham-4b722922

- **A statement Identifying any other significant contributors to the report and where necessary outlining their expertise**

N/A

- **All instructions that define the scope of the report (original and supplementary and whether in writing or oral)**

I have been asked by the Inner Melbourne Planning Alliance (IMPA Inc) to provide a statement in regards to

1. The international norms for the scope of GHG emissions considered necessary to include in a full assessment of climate impacts of major projects;
2. The 'Lock-in' effect of the project with regards to energy-related GHG emissions and whether the climate change impacts of the project are consistent with recommendations of the IPCC 5th Assessment report (2014), and commitments made under the UNFCCC Paris Agreement (2015) relating to keeping global warming well below 2 degrees Celsius.

- **The identity of the person who carried out any tests or experiments upon which the expert has relied on and the qualifications of that person**

N/A

- **The facts, matters ad all assumptions upon which the report proceeds**

Referred to in the report

- **Reference to those documents and other materials the expert has been instructed to consider or to take into account in preparing his or her report, and the literature or other material used in making the report.**

  - WDTP EES Technical Report Q: Greenhouse Gas
  - Submission by William McDougall, Transport Planner to the Senate Economics Reference Committee Inquiry into the operations of existing and proposed toll roads in Australia 7th July 2017
  - West Gate Tunnel Project Report of Will Symons (AECOM) to WGTP IAC
  - EPA Presentation to WGTP IAC Day 1 – 14th August 2017
  - Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report January 2014

- **A summary of the opinion or opinions of the expert**

  1. The methodologies used to conduct the GHG assessment of the WGTP are consistent with international standards for scope of emissions. However, the choice of baseline calculation methodology is not explained and will have had a strong influence of the findings of the assessment regarding relative changes in CO_2 emissions. Explanation of the baseline methodology should be provided and a description of the significant secondary effects included in the assessment provided.
  2. The project presents a significant 'lock-in' risk of GHG emissions and other climate change impacts associated with the low-density suburban land-use patterns, lack of planning for behaviour change, modal choices, low-carbon vehicle standards, health and productivity impacts. The project is contrary to the scientific recommendations of the IPCC with regards to mitigating transport related GHG emissions at the level required to effectively tackle climate change.
  3. The increase in GHG emissions and lock-in effects of high-emissions development patterns overall will undermine commitments made under the Paris Agreement to keep global warming well below 2degC.

- **A statement identifying any provisional opinions that are not fully researched for any reason (identifying the reason why such opinions have not been or cannot be fully researched)**

A statement setting out:

- Any questions falling outside the expert's expertise

My area of expertise is building/built environment-related climate impacts and GHG emissions modelling and not specifically transport related emissions so my statement relates to the overall built-environment scale and not specifically the transport-modelling.

- Whether the report is incomplete or inaccurate in any respect

N/A

1. **Review of Scope of GHG emissions included in the WGT Project GHG modelling against international norms**

According to International Standards (ISO14064) based on the international Greenhouse Gas Protocol developed by World Resources Institute and the World Business Council for Sustainable Development, inventories of GHG emissions, including monitoring and scenarios should include three scopes of emissions:

Scope 1 – Direct emissions – those directly relating to a project or organizations' operations, and which they have control over.
Scope 2 - Indirect emissions associated with generating energy including fossil fuel derived energy products that are consumed by the organization or project
Scope 3 – Indirect emissions associated with the production of materials for the organization or project, induced travel-related emissions, and induced or 'outsourced' activities.

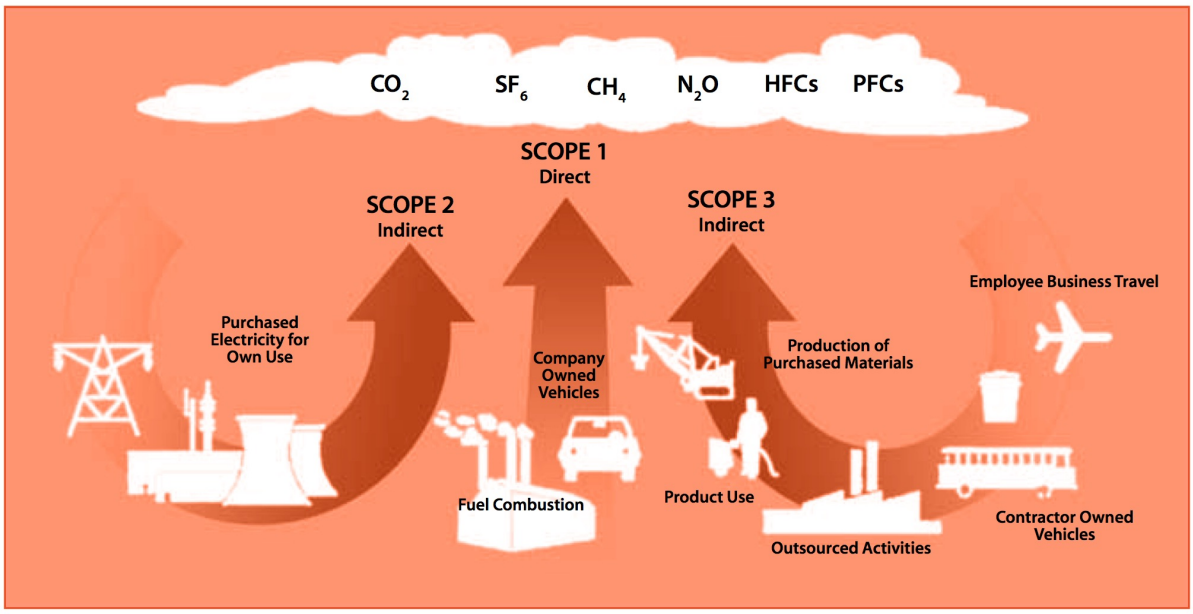


Figure 1: Scope of Emissions (Source: GHG Protocol)

According to international standards, GHG accounting for projects should include an assessment of changes to GHG emissions directly caused by project activities relative to a base-line scenario (Primary effects) and significant unintended or consequential changes in GHG emissions caused by project activity (secondary effects). Secondary effects must be identified as either one-time effects, such as emissions associated with construction, installation or establishment of the project, or decommissioning and termination of project activity; or reoccurring upstream effects, such as those associated with providing inputs to the project, and reoccurring downstream effects caused by project outputs or outcomes.

The GHG assessment boundary for a project must include all primary and significant secondary effects irrespective of whether they occur near a project or at sources or sinks under the control or influence of the organizations involved in the project. The assessment boundary for a project is therefore not a physical or legal boundary, but rather an impact-related boundary.

Primary and significant secondary effects on GHG emissions are assessed relative to a baseline scenario or reference level of GHG emissions which is normally based on a no-project or 'business as usual scenario' projected into the future to cover a time frame of relative accuracy. The assessment boundary is therefore also temporal and should include primary and significant secondary impacts that can be reasonably foreseen over the project life-span.

Review of GHG Assessment of WGTP against international standards
International standards for GHG assessment and accounting are well developed and far more detailed than presented above. However, the basic approach described above provides an over-arching framework with which to review the general alignment of the approach used to assess the impact of the WGTP on GHG emissions and international norms and identify any areas where further work might need to be conducted. I find that the GHG assessment conducted by AECOM for the EES covers the required scopes of emissions in accordance with the WRI/WBCSD GHG protocol and relevant international standards.

However, the WGTP GHG assessment methodology is not clear on any significant secondary effects considered within the assessment boundary. There is also no clear reference to the methodology used to derive the emissions baseline for the project. Reference is made to the NGER scheme – but there are four different baseline calculation methods offered (see; http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines) . The choice of baseline methodology will alter the key findings of the WGTP GHG assessment with regards to projected changes in emissions from the project over time. It would be useful to know which baseline methodology was used and why. It should be noted that the light duty vehicles in Australia have a higher GHG emissions intensity than countries such as China, USA, Japan and the EU. Therefore, changes in emissions are relative to one of the highest vehicle emissions intensity base-lines in the world. Focussing on the relative changes in GHG emissions alone as an indicator of climate change impacts without considering the systemic effects of this project is therefore akin to focussing on the deck-chairs, when the real problem is the ice burg.

2. The 'Lock-in' effect of the project with regards to energy-related GHG emissions and mitigation actions recommended by the IPCC

The 'lock-in' effect relates to the tendency for a large proportion of capital being invested in a small number of high-energy consuming technologies and infrastructure. This leads to a bias for optimising these technologies and supporting infrastructure, supply chains and expertise. This in turn makes it more difficult for lower energy or emissions technologies to compete, or influence low-carbon innovations.

The dominance of road-based automobiles and road infrastructure and the low-density suburban living it services are prime examples of this lock-in effect. Because of the long-life spans of most buildings and infrastructure projects and slow turn-over of vehicles, higher energy demand and related GHG emissions are 'locked-in' to our economies for decades. In the context of uncertainty about future climate impacts, the influence of internet on work-life, and the long-term productivity and health impacts of suburban, car-dependent life-styles the lock-in risks of major projects should be seriously considered. The IPCC note that while building more roads can reduce congestion in the

short term, they also induce increased traffic and associated energy-related GHG emissions in the long-term.

On the issue of climate change, GHG emissions from the transport sector account for 23% of global energy-related GHG emissions and continue to grow despite improvements in vehicle fuel efficiency. Road vehicles are responsible for 80% of this growth. Emissions in 2010 were $7GtCO_2^{eq}$ and are projected to reach $12GtCO_2^{eq}$ by 2050 unless aggressive and sustained mitigation policies are implemented[i].

According to the IPCC the highest mitigation potentials are offered by integrated urban development models that encourage behaviour change, increase uptake of improved vehicle engine performance technologies, low-carbon fuels, transitioning built-environments to support transit-oriented development and providing compact urban forms that support cycling and walking. The IPCC conclude that GHG emissions from road transport can be reduced by:

- Avoiding journeys through increasing urban density, sourcing local products and services, internet shopping, restructuring freight logistics systems and increasing the use of advanced ICT.
- Modal shifts to lower carbon transport systems including increasing investment in public transport, providing walking and cycling infrastructure and modifying roads to minimise travel times.
- Lowering vehicle energy and emissions intensity through policy & regulation, advanced light-weight materials, increasing freight and passenger occupancy rates and encouraging new low-carbon vehicle technologies such as electric vehicles[ii].

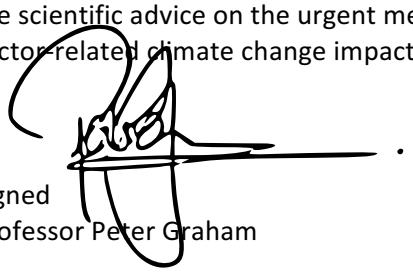
Short and long term mitigation strategies are essential if deep GHG mitigation ambitions are to be realised. Short term measures are needed to overcome barriers and avoid the lock-in effects resulting from expanding urban sprawl, slow turn-over/replacement rates in vehicle ownership and existing infrastructure. Effectively reducing climate change risks and impacts requires medium (up to 2030) and long term (up to 2050) strategies to promote integrated urban planning, development and redevelopment aimed at providing transit oriented development and more compact urban form that encourages cycling and walking. Such actions could reduce transport-related GHG emissions by 20%-50% below 2010 levels[iii].

Co-Benefits & Climate Change Adaptation

Implementing multi-modal approaches to decarbonise urban development and transportation offer significant co-benefits. These include reducing petroleum dependency and increasing energy security, improving access to transport services to the poorest and most vulnerable members of society, reducing congestion, improving air-quality and productivity. Increased adoption of active travel like cycling and walking and reduced use of cars can improve public health and longevity. The IPCC also note that transport infrastructure is highly exposed to climate change impacts and therefore new developments should be investing in appropriate adaptation strategies

The lock-in risks of the WGTP, when viewed against the current scientific recommendations for mitigating climate impacts of the transport sector, appear substantial. The climate change impacts of the proposal are currently assessed narrowly by change in CO_2^{eq} emissions relative to a potentially high business as usual baseline. A more thorough review of lock-in effects and risks relating to the negation of potential integrated urban planning options and their associated climate change mitigation, adaptation and co-benefits should be considered. Overall, the WGTP does not align with

the scientific advice on the urgent measures required to be taken to significantly reduce transport sector-related climate change impacts.



Signed
Professor Peter Graham

[i] Sims R., R. Schaeffer, F. Creutzig, X. Cruz-Núñez, M. D'Agosto, D. Dimitriu, M.J. Figueroa Meza, L. Fulton, S. Kobayashi, O. Lah, A. McKinnon, P. Newman, M. Ouyang, J.J. Schauer, D. Sperling, and G. Tiwari, 2014: Transport. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovern- mental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[ii] Ibid.
[iii] Ibid.