



Minister for Main Roads, Road Safety and Ports
Minister for Energy and Water Supply

Our Reference: CLLO-CIC-16048

09 SEP 2016

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Mr Neil Laurie
The Clerk of the Parliament
Parliament House
Cnr George and Margaret Streets
BRISBANE QLD 4000

Dear Mr Laurie

Re: Tabling of Overseas Travel Report

On 3 August 2016 I travelled to the United States of America, returning on 11 August 2016.

As per section 4.13.9 of the Ministerial Handbook, I am required to table an Overseas Travel Report within one month of my return date.

I request that you please arrange for the attached Overseas Travel Report to be tabled out of session by 11 September 2016, in line with Standing Order 31.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Mark Bailey'.

Mark Bailey MP
**Minister for Main Roads, Road Safety and Ports and
Minister for Energy, Biofuels and Water Supply**

Att: Overseas Travel Report



**Queensland
Government**

REPORT TO PARLIAMENT

TRADE MISSION TO THE UNITED STATES OF AMERICA

3 – 11 AUGUST 2016

HONOURABLE MARK BAILEY MP

**MINISTER FOR MAIN ROADS, ROAD SAFETY AND PORTS AND
MINISTER FOR ENERGY, BIOFUELS AND WATER SUPPLY**

TABLE OF CONTENTS

OFFICIAL PARTY	3
MISSION ITINERARY	4
Meeting with Tesla and tour of Fremont car manufacturing facility.....	12
Meeting with Bloom Energy	14
Meeting with SAP	15
Meeting with Pacific Gas and Electricity.....	16
Meeting with Centre for Sustainable Energy	18
Breakfast with Solar Council Members.....	20
Meeting with Solar Reserve.....	21
Meeting with California Public Utilities Commission.....	22
Meeting with Sunverge	26
Meeting with Red Rock Bio Fuel.....	27
Meeting with Rocky Mountain Institute	29
Meeting with National Renewable Energy Laboratory	31
Meeting with Colorado Department of Transport (CDOT)	33
Site Visit RBF Port Neches Facility.....	34
Lunch meeting with Australian Consul-General in Houston.....	36
Meeting with Flexgen	37

Official Party**Honourable Mark
Bailey MP**Minister for Main Roads, Road Safety and Ports and
Minister for Energy, Biofuels and Water Supply**Professor Paul
Simshauser**Director-General,
Department of Energy and Water Supply**Ms Tam van Alphen**Senior Policy Advisor to the Minister for Main Roads, Road Safety
and Ports and Minister for Energy, Biofuels and Water Supply**Mr Javier Jativa**Deputy Commissioner – North America,
Trade Investment Queensland

Mission Itinerary

Time is in local time

Wednesday, 3 August 2016 – Brisbane / San Francisco

8.00am	Travel to Brisbane Airport and check-in	Brisbane Domestic Airport
9.25 am	Depart Brisbane for Sydney	Qantas Flight QF 513
11.00am	Arrive Sydney	Transfer Terminals
1.00pm	Depart Sydney for San Francisco	Qantas Flight QF0073
9:30am	Arrive San Francisco	Met in arrival area by Mr Javier Jativa, Deputy Commissioner – TIQ North America
10.00am	Transfer to Hotel	
11.00am	Check In at San Francisco Marriott Marriott Marquis (Lunch own arrangements)	780 Mission Street San Francisco CA 94103
12:15 pm	Travel to meeting	
1.30pm	Meeting with Tesla	Main Entrance (Gate 5) 45500 Fremont Boulevard Fremont, CA 94538
3:15pm	Travel to meeting	
4:00pm	Meeting with Bloom Energy	1299 Orleans Dr, Sunnyvale, CA 94089
5:00pm	Return to Hotel	
6:30pm	Arrive Hotel Dinner own Arrangements	San Francisco Marriott
Overnight		

Thursday 4 August 2016

6:00am	Breakfast own arrangements	
8:00am	Depart Hotel for meeting	
9:00am – 11:00am	Meeting with SAP	3410 Hillview Avenue, Palo Alto, CA 94304
11:00am	Lunch with SAP	
2:00pm	Travel to meeting	
3:00pm	Meeting with Pacific Gas and Electricity	245 Market Street, San Francisco, CA
4:00pm	Travel to Hotel	San Francisco Marriott Marquis
4:30pm	Return to Hotel Brisbane Liaison Time	
6:00pm	Dinner with Centre for Sustainable Energy	Scala's Bistro 432 Powell St San Francisco, CA 94102
Overnight		San Francisco Marriott Marquis

Friday 5 August 2016

7:30am	Breakfast with Solar Council Members Minister Hosting	Nob Hill C, Lower B2 Level San Francisco Marriott Marquis
9:00am	Meeting with Solar Reserve	Foyer Café, San Francisco Marriott Marquis
9:25am	Travel to meeting	
10:00am	Meeting with California Public Utilities Commission	505 Van Ness Ave San Francisco, CA 94102
12:00pm – 2:00pm	Travel to Sacramento Lunch en route	
2:00pm – 4:00pm	Meeting with California Department of Transportation regarding electric vehicles	1120 N Street Sacramento, CA 95814TMC
4:00pm	Return to Hotel	
6:00pm	Arrive at Hotel Dinner	San Francisco Marriott Marquis Own arrangements
Overnight		

Saturday 6 August 2016

7:00am	Breakfast	Own arrangements
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9:30am	Depart Hotel for meeting	
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10:00am	Meeting with Sunverge	950 Minna Street, San Francisco
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11:30 am	Return to Hotel	San Francisco Marriott Marquis
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Lunch own arrangements

Brisbane Liaison Time (1 hour)

Dinner own arrangements

Overnight

Sunday 7 August 2016 San Francisco/ Denver

9:00am	Check out of Hotel	
9:20am	Depart Hotel for San Francisco International Airport	
11:47am	Depart for Denver	United Airlines Flight UA2029
3:24pm	Arrive Denver	
4:15pm	Travel to Fort Collins	
5:30pm	Check into Hotel	Homewood Suites Fort Collins 1521 Oakridge Drive, Fort Collins, Colorado, 80525, USA.
	Brisbane Liaison Time (1 hour)	
6:30pm	Dinner own arrangements	
Overnight		Homewood Suites Fort Collins

Monday 8 August 2016

7:00am	Breakfast own arrangements	
8:10am	Depart hotel for meeting	
8:30am	Meeting with Red Rock Biofuels	736 Whalers Way, Building G, Suite 100, Fort Collins
9:30am	Travel to next meeting	
10:30am	Meeting with Rocky Mountain Institute	1820 Folsom Street, Boulder, CO 80302-5703
11:30am	Travel to meeting Light Lunch en Route	
1:00pm	Meeting with National Renewable Energy Laboratory	15013 Denver West Parkway, Golden, CO 80401
2:00	Travel to meeting	
3:00pm	Meeting with Colorado Department of Transportation (CDOT)	CDOT Headquarters 4201 East Arkansas Ave, Denver, 80222
5.00pm	Travel to Denver International Airport	
6:15 pm	Arrive Denver International Airport	
8:15pm	Depart Denver for Houston	
11:35pm	Arrive Houston	

Tuesday 9 August 2016 Houston

12:15am	Travel to Hotel	
12:45am	Arrive hotel	Hilton Americas-Houston 1600 Lamar Street, Houston, TX 77010
Overnight		
6:30am	Breakfast own arrangements	1401 Shoreline Boulevard, Mountain View, CA 94043
7:00am	Depart hotel for meeting	
9:00am	Site visit RBF Port Neches Facility	6501 Hogaboom Rd, Port Neches
11:00am	Travel to next meeting	
1:00pm	Lunch meeting with Australian Consul- General in Houston, Mr Alastair Walton and Mr Mitch Anderson, CEO, Source Power & Gas	Brennan's of Houston (Downtown location) 3300 Smith St, Houston
2:30pm	Travel to next meeting	
3:00pm	Meeting with Denham Capital (cancelled)	
3:45pm	Travel to meeting	
4:15pm	Meeting with Flexgen	
5:00pm	Travel to Houston Airport	
6:00pm	Arrive Houston Airport	
8:00pm	Depart Houston – Los Angeles	American Airlines Flight AA6019
9:35pm	Arrive Los Angeles	
11:20pm	Depart Los Angeles for Brisbane	Qantas Flight QF16
Overnight in Transit		

Thursday 11 August 2016 Brisbane**6.10am**

Arrive Brisbane International Airport

Brisbane International Airport

Official Visit Concludes

Meeting with Tesla and tour of Fremont car manufacturing facility

Date: Wednesday 3 August 2016

Time: 1:30pm

External Attendees:

- Arthur Esswein, Senior Business Development Associate (Tesla Energy)
- Lara Olsen, Regional Manager, Business Development and Policy (Tesla Energy)

Background:

- In June 2015 the Premier met with Tesla during a delegation to the United States.
- The Palaszczuk Government is committed to the uptake of renewable energy technology and has established an independent taskforce to investigate credible pathways to meeting our 50% renewable energy target by 2030.
- The Palaszczuk Government also has a target to grow Queensland solar PV uptake to a million rooftops or 3000 megawatts by 2020. We currently have around half that amount (1500 megawatts) in rooftop solar.
- Tesla has invested in a super-charger for network between Melbourne and Sydney – and has plans to extend this to Brisbane.
- Tesla has also been investigating potential opportunities in North Queensland to sell its utility storage batteries for council projects.
- In April 2016 the ACT government announced initial winners of their \$600,000 energy storage pilot program. The Tesla Powerwall is one of the products that will be used in the subsidised roll-out of battery storage systems to households in Canberra.

Meeting Summary

- The Minister was provided with a tour of the Tesla factory, the principal production facility of Tesla Motors.
- The tour and subsequent meeting provided an opportunity to better understand Tesla's technological advancements and views on policy settings that best assist increasing uptake of renewable energy, battery technology and electric vehicles.
- Tesla representatives shared insight on how United States policymakers and regulators are handling the emergence of distributed energy, and opportunities to improve existing regulatory frameworks.
- Getting the regulation right to enable the safe and efficient integration of distributed generation and storage into Queensland's electricity system was a focus of discussion, with Tesla representatives confirming it accredits battery installers and encourages establishment of standards.
- The meeting also provided the Minister the opportunity to encourage Tesla to partner with Queensland companies in the area of battery storage and electric vehicles and to highlight Queensland's interest in working with global companies where there is a value add (rather than just a sale) and undertaking collaborative research and development in renewable energy storage and electric vehicles.

- The Minister discussed the Palaszczuk Government's plans to deliver an electric vehicle super highway that will accommodate the installation of fast chargers along our coast up to Cairns. Tesla representatives provided advice about Tesla's preference and strategy for determining super charger locations.
- The role of storage technology, including electric vehicles, to stabilise the grid by reducing demand during peak times, and as part of solution for remote communities was also discussed.

Meeting with Bloom Energy

Date: Wednesday 3 August 2016

Time: 4:00pm

External Attendees:

- Mr Randy Ahuja, General Manager, International Operations
- Ms Kristen Clevon, Senior Manager, International Market Development

Background:

- Trade and Investment Queensland's North America Commissioner David Camerlengo has been in discussions with Bloom Energy about opportunities in Queensland since December 2015.

Meeting summary:

- The meeting provided an opportunity for the Minister to gain an understanding of Bloom Energy's fuel cell technology, to inspect that technology and to discuss potential opportunities for collaboration in Queensland.
- Through discussions, a potential for Bloom Energy's fuel cell technology to fit into and complement Queensland's renewable energy generation framework was identified.
- Bloom Energy representatives stated that their fuel cell technology should be seen as part of a mix of renewable energy solutions, and for example, as a complement to solar projects, as it provides consistent output that can help address full base load needs.
- Bloom Energy representatives expressed interest in collaborating with Queensland companies and universities in research and development and whether they would consider potentially establishing a manufacturing operation in Queensland.
- The Minister highlighted opportunities for investment in Queensland, and encouraged Bloom Energy to visit Queensland to meet and discuss partnership opportunities with key stakeholders in Queensland energy sector.

Meeting with SAP

Date: Thursday 4 August 2016

Time: 9:00am – 11:00 am followed by Lunch

Attendees:

- Steven Kim- Senior Director, Products & Innovation, Connected Vehicles Sustainability
 - Stefan Wolf- Solution Management, Utilities
-

Background:

- SAP (System analyses and Programme networking; Systems, Applications & Products in Data Processing) is a German multinational software corporation that makes enterprise software to manage business operations and customer relations.
- SAP is headquartered in Walldorf, Baden-Württemberg, Germany, with regional offices in 130 countries. The company has over 293,500 customers in 190 countries.
- SAP has approximately 4200 utility customers across 118 countries. This gives SAP a truly global view and they are able to spot emerging trends very quickly.
- The company is a component of the Euro Stoxx 50 stock market index

Meeting Summary:

- The meeting was an opportunity for the Minister to understand SAP capabilities in the Energy industry and for SAP to share insights in respect of future progress in digital technology and their global view of trends in the energy industry.
- SAP representatives identified SAP's strategy in the energy sector. Applications and Portals powered by SAP's HANA IT Platform and its applications for energy networks, distributors and retailers.
- SAP identified that the 3 main global trends affecting utilities such as energy distributors are population growth, growing middle class and urbanization. SAP also identified what it considers to be transformation drivers for major utilities, including decarbonisation, deregulation, decentralization, energy efficiency digitization and digital controls.
- SAP provided an overview of trials it has contributed to, of digital sensors and controls (similar to digital meters) which provide real-time information flows to enable safe operation of the grid with intermittent sources, and to enable predictive maintenance intelligence, avoiding unnecessary maintenance and upgrade works.
- Topics discussed during the meeting included implications of big data and cloud technology (SAP is a cloud provider – and identified how Cloud technology is impacting on utility rate cases in the US, as it comprises opex, not capex) along with other disruptive technologies including autonomous vehicles and digital printing, which are impacting global markets and traditional models of competition.

Meeting with Pacific Gas and Electricity

Date: Thursday 4 August 2016

Time: 3:00pm

Attendees:

- Martin Wyspianski, Senior Director, Renewable Energy, Energy Procurement
 - Joe Lawlor, Energy Policy and Procurement
 - Peter Griffes, Ph.D, Director, Market Design & Monitoring, Energy Supply Management
 - Paul Gribik Principal – Energy Procurement – Market Analysis, Design and Strategy
-

Background:

- PG&E is privately owned, and one of the largest combined natural gas and electric utilities in the US, with approximately \$60 billion in assets and a \$17 billion revenue.
- PG&E experienced the market crash in 2001, and has in depth knowledge of causes of market failures, deficiencies in market structures, and the challenges and opportunities for utilities associated with uptake of renewable energy - which makes up approximately 27% of PG&E's energy mix delivered to retail customers.
- On 11 July 2016 Enphase, a global energy company, announced a pilot program with PG&E to integrate and optimise smart microinverters used in distributed energy generation.
- The program will support PG&E to demonstrate and implement its Distributed Energy Resource Management System (DERMS) for real-time data integration and control of distributed energy resources.
- PG&E will evaluate how smart microinverters from Enphase used with customer-sited solar can be controlled and coordinated with grid management and voltage optimization technology. The program goals are to support increased penetration of distributed energy resources and to increase overall operational efficiencies of the entire system.

Meeting outcomes:

- The meeting provided an opportunity for the Minister, as a Shareholding Minister of State owned energy generation, transmission and distribution companies to exchange lessons learnt with PG&E in respect of transmission and distribution of energy in large markets and to
- The meeting also provided the Minister with an opportunity to better understand the practical implications of recent policy changes in California - in particular, the impacts of renewable energy generation and storage on electricity transmission and distribution services in California and the US at large.
- Energy market reforms and safety and reliability of large scale energy networks was a focus during the meeting. PG&E identified that along with their current renewable mix, gas remains a significant base load, along with hydro. A significant issue identified by PG&E was quality of energy (voltage consistency), rather than capacity of their network.
- The Minister identified current challenges in distributing energy across the breadth of Queensland and our remote communities, the Queensland Government approach to tariff structures, including UTP/subsidisation to ensure regional customers pay the same as SEQ.

- PG&E discussed possible energy tariff reforms in California, including to incentivise off-peak charging of electric vehicles and the role for State governments and utilities in establishing the necessary infrastructure to support large scale deployment of EVs. Current challenges and opportunities with Tesla superchargers which are now commonly available in California were also discussed.
- PG&E provided insights to current community renewable power schemes in the US, identifying societal challenges, including fair compensation for continued reliance by those schemes on the grid, and impact on other, potentially lower income, consumers.
- Opportunities to maximise growth in Queensland by improving the function of gas markets was also raised by the Minister and discussed with PG&E.

Meeting with Centre for Sustainable Energy

Date: Thursday 4 August 2016

Time: 6:00pm

Attendees:

- Mr Sachu Constantine, Director of Policy
 - Ms Stephanie Wang, Senior Manager, California, Policy & Strategy
 - Mr Steve Weissman Senior Policy Advisor
 - Dr Fereidoon P. Sioshansi, Ph.D., President, Menlo Energy Economics
 - Mr Steve Blume, President, Australian Solar Council
-

Background:

- CSE is a NGO and leader in sustainable energy program delivery, working with policymakers, regulators, public agencies and businesses
- CSE is currently involved in the Virtual Net Metering Market Development Project.
- The three-year project led by CSE is rooted in expanding the awareness, effectiveness and use of virtual net energy metering (VNEM) in California and beyond. Main objectives are to identify challenges and opportunities associated with the currently underutilized NEM-V tariff — a special utility billing arrangement that allows energy generation credits from a single solar system to be shared virtually among multiple tenant accounts.

Meeting Summary:

- The purpose of this meeting was to discuss CSE's areas of expertise and synergies with the current Palaszczuk Government renewable energy agenda.
- The meeting provided an opportunity for the Minister to hear CSE's views on barriers and opportunities for the deployment of renewable energy, and relationship to EVs.
- CSE emphasised the challenges in getting policy settings right, but also the great opportunities inherent in the Queensland State owning energy utilities.
- The Minister discussed our energy markets and regulatory system, and the need to provide services to enable better consumer engagement with the energy market. The Minister also provided an overview of the education campaign developed for de-regulation of the energy market in South East Queensland.
- Tariff reform relating to solar uptake were discussed – CSE identified because of structure of charges, there has been little incentive for domestic batteries in California. That is because rather than having a feed in tariff, households in California are able to export back to grid at retail value, and effectively use grid as storage, arguably without paying for that storage service. CSE discussed the possibility of VNEM as a means of achieving equity, and the Minister highlighted policy work being undertaken by the Palaszczuk Government, including through the QPC inquiry into a fair price for solar.
- Implementation of the Palaszczuk Government's biofuels mandate was discussed, along with the value proposition of EVs and solar connected to the grid, with CSE identifying that the ability to control rate of EV charging meant that EVs can effectively be used as an energy storage facility. The Minister also took the opportunity to obtain CSE's views on options to incentivise EV uptake.

- CSE also led a discussion on ‘second life batteries’, identified that the US is now getting its first generation of car batteries which are at end of car life, operating at 70% (after approximately 7/10 years of use), and which have to be removed but can be used in the home.
- CSE’s expertise provided valuable insight into emerging energy issues at the global level, and lessons learnt from the deployment of renewable programs in California.

Breakfast with Solar Council Members

Date: Friday 5 august 2016

Time: 7:30am

Attendees:

- Mr Steve Blume, President, Australian Solar Council
- Mr Rob Rogan, Director Business Development Residential and Commercial Energy Solutions, SunPower
- Mr Tom Georgis, Senior Vice President of Development, Solar Reserve
- Mr Ray Hudson, Global Head of Solar, DNV-GL
- Mr Nigel Cockroft, US General Manager, Jinko Solar
- Mr Arthur Haubensstock, Vice President, 8 Minute Energy
- Ms Mona Tierney-Lloyd, Senior Director, Regulatory Affairs, EnerNoc
- Ms Mio Dart, Systems Integrator Engineer, Redflow
- Mr Mark Higgins, COO & VP, Strategen Consulting, LLC
- Mr John Berdnew, Vice President of Regulatory and Policy Strategy, Enphase
- Mr Thomas Lee, Senior Product Manager, Enphase
- Mr Pat Moore, S&C Electric Company
- Mr Andrew Dreyer, Deputy Departmental Manager, Global Environmental & Infrastructure Business Group
- Mr Andrew Tanner, VP Business Development, Geli – software solutions for energy storage

Background:

The Australian Solar Council is a not-for-profit organisation and is governed by a volunteer board elected by its members and which promotes scientific, social and economic development through the environmentally sound use of solar energy.

The Minister co-hosted a breakfast with Solar Council Members to highlight Queensland as a destination for renewable energy projects, and to seek industry feedback on policies that have been successful in the US, and those that could have been improved to facilitate transition to a clean energy economy.

Event summary:

- The Minister provided an overview to members of the Palaszczuk Government's renewable energy aspirations and solar future policies.
- Each industry representative provided a short summary of their top policy issues and engaged in a group discussion, which assisted the Minister to gain a more detailed understanding of issues facing solar companies in Queensland, and how the government can further encourage investment.
- Many representatives expressed strong interest in opportunities to come to Queensland.

Meeting with Solar Reserve

Date: Friday 5 August 2016

Time: 9:00am

Attendees:

- Mr Tom Georgis Senior Vice President of Development
-

Background:

- Solar Reserve is a leading global developer of utility-scale solar power projects, which include electricity generation by solar thermal energy and photovoltaic panels. Solar Reserve has commercialized a proprietary advanced solar thermal technology with integrated energy storage that solves the intermittency issues experienced with other renewable energy sources.
- The company currently has more than \$1.8 billion of projects in operation worldwide, with development and long-term power contracts for 482 megawatts (MW) of solar projects representing \$2.8 billion of project capital.
- Solar Reserve's has assembled an extensive global development pipeline of 10 gigawatts (GW) across the world's most attractive, high growth renewable energy markets.

Meeting Outcomes:

- This meeting provided the Minister with an opportunity to understand the Solar Reserves hybrid technology, and how it compares with traditional renewable energy solutions, and how this could be utilised in Queensland.
- The Minister also took the opportunity to highlight the benefits of Solar Reserves investing in Queensland based projects, and offered to host Solar Reserves should they visit Queensland.

Meeting with California Public Utilities Commission (CPUC)

Date: Friday 5 August 2016

Time: 10:00am

Attendees:

- Mr Michael Picker, President
 - Mr Scott Murtishaw, Energy Advisor to the President
 - Mr Edward Randolph, Energy Division Director CPUC
 - Dr. Steve St. Marie, Policy and Planning Analyst
 - Fereidoon P. Sioshansi President, Menlo Energy Economics
-

Background:

- The energy work responsibilities of the CPUC are derived from the California State Constitution, numerous state legislative enactments and various federal statutory and administrative requirements.
- Staff, on behalf of the CPUC, carry out this work either as an adjunct to federal authority or representing the Commission and the people of the State of California in federal legislative, regulatory or judicial matters.
- CPUC has responsibility for the following program areas:
 - Electricity costs
 - Electric power procurement and generation
 - Infrastructure
 - Customer energy resources
 - Energy efficiency
 - Energy advice letter and tariff information

Meeting outcomes:

- This meeting allowed the Minister to better understand the regulatory and policy framework of energy and water utilities in the US, and to be presented with a regulator's perspective on lessons learnt from transformational change of the energy sector.
- President Picker identified challenges faced by the California Public Utilities Commission (CPUC) in relation to energy issues and solutions, with the Minister discussing how this experience can be used in Queensland.
- CPUC staff provided a presentation on the Californian and US energy framework, and reform agenda for the National Energy Market and rate design, as well as learnings from the New York Public Utility Commission
- Utility scale and commercial and industrial solar PV is much more prevalent in California than rooftop solar, driven by climate change policies, but that much policy focus is currently on rooftop PV.
- The Minister highlighted Queensland's progress with rooftop solar, and continuing focus to increase CNI and large scale solar, after a lack of progress under the previous government.
- The role of battery storage both at the home and network level was discussed, as well as current barriers to EV uptake in California, including low gas prices.

- CPUC staff identified that they are looking at different locational values for distributed energy resources, based on digital metre data, but this work is only in the early stages.
- The Minister identified that similar policy work, including to quantify the value of renewables to the grid, was currently underway in Australia.

Meeting with California Department of Transportation, Department of Motor Vehicles, and the California Transportation Commission regarding electric vehicles and road policy issues

Date: Friday 5 August 2016

Time: 2:00pm – 4:00pm

Attendees:

- Mr Kome Ajise, Chief Deputy Director
- Ms Norma Ortega, Chief Financial Officer
- Mr Steve Takigawa, Deputy Director, Maintenance and Operations
- Ms Carrie Pourvahidi, Road Charge Pilot, Program Manager
- Mr Marlon Flournoy, Acting Assistant, Director of Sustainability
- Mr Bernard C. Soriano, Ph.D, Deputy Director (in charge of autonomous vehicles program)
- Ms Susan Bransen, Executive Director
- Ms Kristina Assouri, Chief Deputy Director

Background:

- The Californian Senate Bill 1298 required the DMV to adopt regulations governing the testing and use of autonomous vehicles on public roadways by 2015.
- California's autonomous vehicles testing regulations became effective in September 2014. As of June 22, 2016, the DMV has issued autonomous vehicle testing permits to over 14 entities (Volkswagen Group of America, Mercedes Benz, Google, Delphi Automotive, Tesla Motors, Bosch, Nissan, GM Cruise LLC, BMW, Honda, Ford, Zoox, Inc, Drive.ai Inc and Faraday & Future Inc) as part of an Autonomous Vehicle Tester Program.
- The DMV is currently developing regulations for post-testing deployment of autonomous vehicles – covering requirements for manufacturers to certify their autonomous vehicle has been successfully tested, meets certain safety requirements and is ready for the general public to operate on public roads.
- The Palaszczuk Government is closely monitoring advances in autonomous vehicle technologies and associated regulatory reform, both in Australia and internationally, to ensure Queensland is prepared for these disruptive technologies.

Meeting Outcomes:

- The departments provided the Minister with an overview of their approach to development and implementation of regulation for testing and deployment of autonomous vehicles on the public road network.
- California has established a state-wide steering committee with industry partners to conduct testing, and provided a detailed presentation on the regulations that apply and the department's approach to approving testing permits.
- The department reported that 16 crashes had occurred since testing permits had been issued, and they shared perspectives on deployment regulation challenges.

- These insights were invaluable as the Palaszczuk Government continues to plan for Intelligent Transport Systems, including autonomous vehicles, and the Minister established good contacts for ongoing communications on these issues.
- The Department also provided a presentation on sustainability measures being implemented in California, including investment in electric vehicle and hydrogen fuelling stations, as well as voluntary trials being undertaken in respect of user pays road funding
- The Minister took the opportunity to highlight road safety initiatives implemented by the Palaszczuk Government, including Co-Lab, getting young people involved in the road safety conversation, and wide centreline treatment.

Meeting with Sunverge

Date: Saturday 6 August 2016

Time: 7:00am

Attendees:

- Ken Munson – President and CEO
 - Clint Davis – Senior Vice President, Product and Program Management
 - Stuart Statman – Senior Vice President, Technology
-

Background

- Sunverge is an innovator in distributed energy technology and its views translate to the Queensland market.
- Ergon Energy is using Sunverge's product offering as part of its Integrating Network Tariffs and Customer Distributed Energy Resources project.
- Energex is conducting a battery trial in Rocklea with multiple setups including a Sunverge system. The Premier officially launched the Energex trial on 19 January 2016.
- The Minister attended the opening of Sunverge's Brisbane office in Fortitude Valley on 6 August 2015; this is Sunverge's only office outside of California.
- The Department of Energy and Water Supply is in regular contact with Sunverge.
- In August 2016, AGL announced the launch of what will be the world's largest virtual power plant (VPP), ultimately involving 1,000 connected Sunverge batteries installed in homes and businesses in South Australia, providing 5 MW of peaking capacity and offering customers the opportunity to save on their energy bills.

Meeting Outcomes

- The Minister met with Sunverge in their corporate headquarters, and toured their laboratory to better understand Sunverge technology and capabilities and to explore opportunities for further collaboration.
- Discussions covered the strategic direction of Sunverge and its views on the future of distributed generation.
- Sunverge advised that it is ready to deploy virtual power plants (VPP) at scale, having recently deployed in South Australia and other jurisdictions around the world.
- The Minister was also provided with a demonstration of Sunverge's production systems, their focus on integration with major systems, and ability to monitor and interpret system stability, including to optimise the operation of their VPPs to delay the need for new network investment.
- The Minister identified a real potential for Sunverge's current and future technology to assist in achieving the Palaszczuk Government's strategic energy objectives of better functioning energy markets and enhancing customer value.
- The Minister was also able to gain an understanding of the regulations and policies in the US that have enabled Sunverge to operate and grow, and to identify learnings that could be brought back to Queensland.

Meeting with Red Rock Bio Fuel

Date: Monday 8 August 2016

Time: 8:30 am

Attendees:

- Terry Kulesa, Co-founder & CEO
 - Jeff Manternach, Co-founder & Chief Financial Officer
 - Jim Moore, Director of Engineering
 - Joe Winckler, Director of Operations
 - Mary Dinh, Project Manager
 - Sue Primsky, Accounting Manager
 - Raffi Mardirosian, Joule Group VP, Corporate Development
-

Background:

- Red Rock is an ‘advanced biofuel’ company primarily focused on making jet fuel from woody biomass.
- Their technology converts biomass via gasification and the Fisher-Tropsch process to make a synthetic crude oil that can be refined to finished fuels.
- In January 2016, Red Rock was purchased by another large biofuel company, Joule, based in Bedford, Massachusetts.
- Red Rock is building a \$200M commercial scale refinery in Southern Oregon using forestry and sawmill wastes and by-products as a biomass feedstock. The plant will process an estimated 140,000 dry tons of woody biomass annually into at least 12 million gallons of jet fuel, biodiesel and naphtha fuel.
- Red Rock plans to use non-millable material such as small branches and needles from the 97,600-acre Collins Lakeview Forest, a private forest that feeds the Lakeview Sawmill.
- Red Rock expressed interest in the recent Virgin Australia/Air-NZ advanced biofuel tender to supply 200 million litres of renewable jet fuel.
- Red Rock Biofuels has contracts to supply fuel to both FedEx and Southwest Airlines to supply three million gallons (11 million litres) of biofuel a year between 2017 and 2024, and also has supply contracts with the US Navy.
- A bio-refining project in regional Queensland would help create rural jobs, both directly and indirectly, and lead to value-adding of agricultural commodities.

Meeting Outcomes:

- The purpose of this meeting was to build a working relationship with Red Rock and to further promote the credentials of Queensland as a destination for bio-refineries and as a US Navy refueling location.
- The Minister emphasised the Palaszczuk Government’s focus on attracting biofuel investment to Queensland, to support a clean energy economy and regional jobs, providing an overview of the biofuels mandate commencing on 1 January 2017. The Minister also explained the key features of Queensland’s Biofutures Roadmap agenda.

- Red Rock advised of its need for consistent, homogenous feed stock, and that financing is based on feedstock for 10-20 years, with cost locked in and escalated to the price of diesel.
- The Minister highlighted the availability of sugar cane in Queensland, which was of interest to Red Rock, which confirmed that it was investigating possible investment opportunities, particularly as it was progressing through a competitive tender process with Virgin and Air New Zealand to supply 200 million litres of locally produced renewable jet fuel
- Red Rock shared its current challenges and strategy to seek to reduce the size of its plant without losing economies of scale and also provided advice about the nature of sustainability requirements it is required to meet, for both US and EU based customers, providing helpful global insight to the Minister.

Meeting with Rocky Mountain Institute

Date: Monday 8 August 2016

Time: 10:30 am

Attendees:

- Mr James Newcomb, Managing Director, Electricity Practice
 - Ms Leia Guccione, Manager, Electricity and Industrial practices
 - Mr Dan Cross-Call, Manager, Electricity Practice
 - Ams Coreina Chan, Manager
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Background:

- The Rocky Mountain Institute (RMI) is a world famous think tank, which seeks to drive efficient and restorative use of resources.
- RMI is a credible, well-resourced and internationally experienced source of expertise in renewables and energy efficiency and demand management.
- With philanthropic support, RMI and its Electricity Innovation Lab convene and collaborate with diverse partners—business, government, academic, non-profit, philanthropic, and military to accelerate and scale solutions that tackle the toughest long-term problems.
- RMI demonstrates sustainability initiatives including: using renewable energy for its buildings (wind power and solar); using efficient lighting, free bus passes for staff, encourages bicycle commuting and for attending meetings; waste reduction, green printing, organic food supplied for lunch and green cleaning products used.
- RMI has around 150 full-time staff, annual operations of around USD 30 million and its scope of operations and interests is not confined to the energy sector as such, encompassing the building, transport and general industrial sectors in the USA and world-wide.

Meeting Outcomes:

- This meeting provided opportunities for the Minister to understand learnings from RMI research and their possible application in Queensland, and to consolidate the relationship with RMI established during the Premier's recent visit to the US.
- The discussion covered challenges in renewable uptake and the need to drive innovation and meet ambitious energy goals, while maintaining service and equity. RMI and the Minister agreed that an essential focus is on the necessary policy and technical requirements necessary to ensure that renewable uptake is inclusive of all sectors of the economy and all segments of the population.
- The Minister outlined the work being undertaken by the independent expert panel appointed by the Palaszczuk Government to investigate credible pathways to achieve a 50% renewable energy target by 2030, with RMI confirming common ground with the issues being canvassed through their research into high renewable and high efficiency futures.

- RMI explained the role of E-Lab, being a place to collect ideas out of the box, and to allow utilities to work with the private sector and have a conversation about how to disrupt their own business models to keep pace with change in the energy sector.
- RMI also outlined work being undertaken on the economics of demand side flexibility, which has identified the possibility of significant savings (approximately \$13 billion in the US) if that could be accessed, in terms of avoided network augmentation, and the importance of distributed energy resources for security and resilience of future networks.
- The Minister explained the Palaszczuk Government's approach to EVs, with RMI sharing its thinking on how best to accommodate EV related load, and possible new business models to facilitate EV uptake.

Meeting with National Renewable Energy Laboratory

Date: Monday 8 August 2016

Time: 1:00pm

Attendees:

- Dr John Barnett, International Program Manager
 - Dr Thomas Foust, Director, National Bioenergy Centre
 - Dr Benjamin Kroposki, Director, Power Systems Engineering Centre
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Background:

- The National Renewable Energy Laboratory (NREL) is the US Federal Government's research facility for clean energy – similar to Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO).
- The NREL develops clean energy and energy efficiency technologies and practices, advances related to science and engineering, and provides knowledge and innovations to integrate energy systems at all scales.
- NREL collaborates with technical institutions and governments around the world to strengthen clean energy markets by conducting resource and technology assessments, sharing policy best practices, fostering business and investment partnerships, and building capacity through training and technical support.
- As part of its mission, the NREL focuses on four key research areas:
 - Sustainable Transportation (vehicle technologies, hydrogen and biofuels);
 - Energy Productivity (residential and commercial buildings);
 - Renewable Electricity (solar, wind, water/marine hydrokinetics, geothermal); and
 - Systems Integration (grid integration of clean energy, distributed energy systems, batteries and thermal storage, energy analysis).
- NREL employs about 100 people working solely on grid integration of renewables and clean energy systems, from transmission, distribution, into households.

Meeting Outcomes:

- Discussions focused on NREL work concerning the integration of renewables, strategies to deal with the challenges of that transition, and operational issues relating to new biofuels industries.
- NREL identified, for example, that its studies indicated that grids can accommodate 30% renewable energy without needing any significant changes to infrastructure.
- Queensland has the highest level of solar penetration on residential homes in the world and this meeting provided the Minister with an opportunity to have detailed discussions about policy dealing with that capacity, how capacity could be further expanded, and what other renewables would work best with household PV.

- NREL also identified challenges experienced by US utilities with rooftop solar, including knowing location and tracking usage, and that utility scale renewables is better understood, and has therefore been more of a focus.
- NREL shared their new thinking on 'smart' PVs and 'smart' wind turbines, made with synthetic inertia. Rather than disconnecting if a disturbance is detected, exacerbating intermittency issues, 'smart' inverters would respond by pushing energy back into the grid, to help stabilise it.
- NREL also shared insights in respect of sustainability of large scale biofuel production.

Meeting with Colorado Department of Transport (CDOT)

Date: Monday 8 August 2016

Time: 3:00pm

Attendees:

- Shailen P. Bhatt, Executive Director
- Mr Peter Kozinski, Director, RoadX Program
- Herman Stockinger, Director, Office of Policy & Government Relations
- Joshua Laipply, Chief Engineer
- Michael Lewis, Deputy Executive Director

Background

- Transmax is a Brisbane-based, proprietary company owned by the Palaszczuk Government that develops and provides intelligent transport system (ITS) products and services to help maximise road network performance and manage traffic congestion. Its main product is the international-award winning STREAMS, which enables holistic road network management.
- The STREAMS Managed Motorways technology utilises a rules-based software engine to manage speed limits, lane closures, variable message signs and ramp metering sites to manage and optimise traffic flow during peak conditions, motorway incidents, planned events and inclement weather.
- Users of the STREAMS Managed Motorways technology have reported a number of positive outcomes such as travel time savings of 42% during peak periods, a 30% reduction in motorway accidents, and an 11% reduction in greenhouse gas emissions.

Meeting Outcomes:

- The Minister announced that Transmax would deliver a managed motorway functionality trial for CDOT on a 17-mile section of the I-25 Northbound (between Ridge Gate Parkway and University Boulevard) in Denver Colorado.
- The meeting allowed an exchange of information and experience in relation to the development and deployment of Autonomous Vehicles, Co-operative Intelligent Transport Systems, including Emergency Vehicle Priority and equivalents in the US.
- The Minister highlighted the Palaszczuk Government's focus on road safety, identifying that he is the State's first Minister for road safety, and provided an overview of key road safety strategies.

Meeting with RBF and Site Visit of Port Neches Facility

Date: Tuesday 9 August

Time: 9:00am

Attendees:

- Mr Paul Soanes, President and CEO
 - Roger Fowler, SVP of Manufacturing & Technical
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Background:

- The US Government and many state governments offer a range of regulatory incentives, grants and funding programs to directly and indirectly support the biofuel industry.
- A major element of this is the RFS which requires that, by 2022, 36 billion gallons (136 billion liters) of renewable fuel must be blended into domestic transportation fuels each year, with a certain percentage being required to be advanced biofuel such as that derived from renewable biomass.
- Renewables Bio Fuels (RBF) owns and operates the largest biodiesel production facility in North America, with operation capacity of approximately 140 million gallons. That single asset has represented 7-8% of the US biodiesel market for each of the last 3 years.
- RBF is headquartered in Houston, and its plant is located in Port Neches.

Meeting Outcomes:

- The Minister toured RBF's Port Neches facility, including the on-site laboratory, and met with RBF, exchanging information regarding biodiesel markets and production facilities.
- The meeting provided an opportunity for the Minister to gain an in depth understanding of the key challenges, risks and investment climate required to develop large-scale biodiesel production projects for potential application in Queensland.
- RBF uses similar technology and feedstocks to those used by biodiesel producers in Australia and discussions with RBF about their experience in the US market were instructive – particularly in respect of implementation of their mandate and related exemption framework.
- RBF emphasised that biodiesel plants are capital intensive, with 90% of operating costs relating to feedstock. RBS accepts a variety of feedstock, for example soybean, canola, tallow and corn, but has a pre-treatment plant that enables use of differing grades of feedstock and a consistent quality of output.
- RBF identified the importance of logistics and volume to success of their operation. RBF relies on trimodal transport – the facility is connected to the train line, has a 100 truck per day maximum capacity, and RBF has an existing deep-water dock with barge and ship capability, and will be constructing a new marine dock.
- The Minister discussed the Palaszczuk Government's Biofutures Roadmap, and implementation of the biofuels mandate, including preparation of the exemption framework and sustainability criteria. RBF identified that exemptions have been a significant issue in

the US, with various operators continuing to seek changes to the framework. RBS also spoke to differences in sustainability certification requirements, which are more onerous in the EU than in the US.

Lunch meeting with Australian Consul-General in Houston and Source Power & Gas

Date: Tuesday 9 August 2016

Time: 1:00pm

Attendees:

- Mr Alastair Walton Australian Consul-General in Houston
 - Mr Mitch Anderson, CEO, Source Power & Gas
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Background

- On 13 June 2014, the Prime Minister of Australia announced the opening of an Australian Consulate-General in Houston with jurisdiction over Oklahoma, Louisiana, Arkansas and Texas. Austrade offices in the United States focus mainly on investment attraction.
- Source Power & Gas is wholly owned by ERM Power Limited, an Australian energy company, and is a Texas-based retail energy provider with operations in Texas, Illinois, Ohio, Maryland and New Jersey. SPG is not tied to a generation or distribution company. Its main focus is to source energy at competitive value for customers.
- Founded in 1980 in Brisbane, ERM Power Limited initially developed gas plants, but it entered the retail market in 2008 and went public in 2010, subsequently opening offices in other regions of Australia. ERM entered the US energy retail market in 2014 with the purchase of SPG.

Meeting Outcomes

- The Minister sought information about trends among Houston energy companies, including their willingness to invest in Australia, and used this opportunity to further strengthen ties to the Australian Trade and Investment Commission (Austrade) to attract investment to Queensland.
- The Minister reiterated the interest of the Palaszczuk Government in cooperating with the Austrade in Houston to foster US investment in Queensland's energy sector.
- Discussions covered key policy and regulatory issues that would increase the competitiveness of Queensland as a recipient of investment in the energy sector.
- Comparative road safety policies and relativity of road safety statistics in Queensland and Texas was discussed, including cultural differences, historical trends and contemporary practices.

Meeting with Flexgen

Date: Tuesday 9 August 2016

Time: 4:15pm

- Mr Doug Moorehead, President and Chief Technology Officer
 - Mr Stevan Jones, Director Communications
 - Mr Patrick Hanlon, Trade Commissioner and Consul – Austrade Houston
 - Ms Daniela Rees, Investment Director – Austrade Houston
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Background:

- FlexGen has created a hybrid system that plug into existing generators and convert and store energy from multiple sources, and says it can save companies significant amounts in fuel costs and maintenance spending.
- FlexGen undertook a scoping visit to Australia in February 2016 and has lodged a request for information on investment prospects with the Queensland Government via Austrade in July 2016.
- FlexGen considers Australia a tier one market for potential expansion and is looking to expand a client base in Australia for its microgrid, power conversion and hybrid power products.

Meeting Outcomes:

- FlexGen provided a detailed presentation on their technologies and software energy solutions.
- Discussions covered the potential for FlexGen's current and future technology to assist the Palaszczuk Government in transitioning to a clean energy future, with the Minister identifying potential for FlexGen's expansion in Australia.
- FlexGen also provided insight on how innovative technology companies operates within the US regulatory and policy framework, and the current status of the US energy storage market.
- The Minister invited FlexGen to visit Queensland with a view to setting up operations in Queensland.