

3rd Lithium

Supply & Markets Conference



LSM  11

Frank D. Wheatley, Talison Lithium Limited

Global Electrification & The Lithium Industry



3rd Lithium

Supply & Markets Conference

Overview

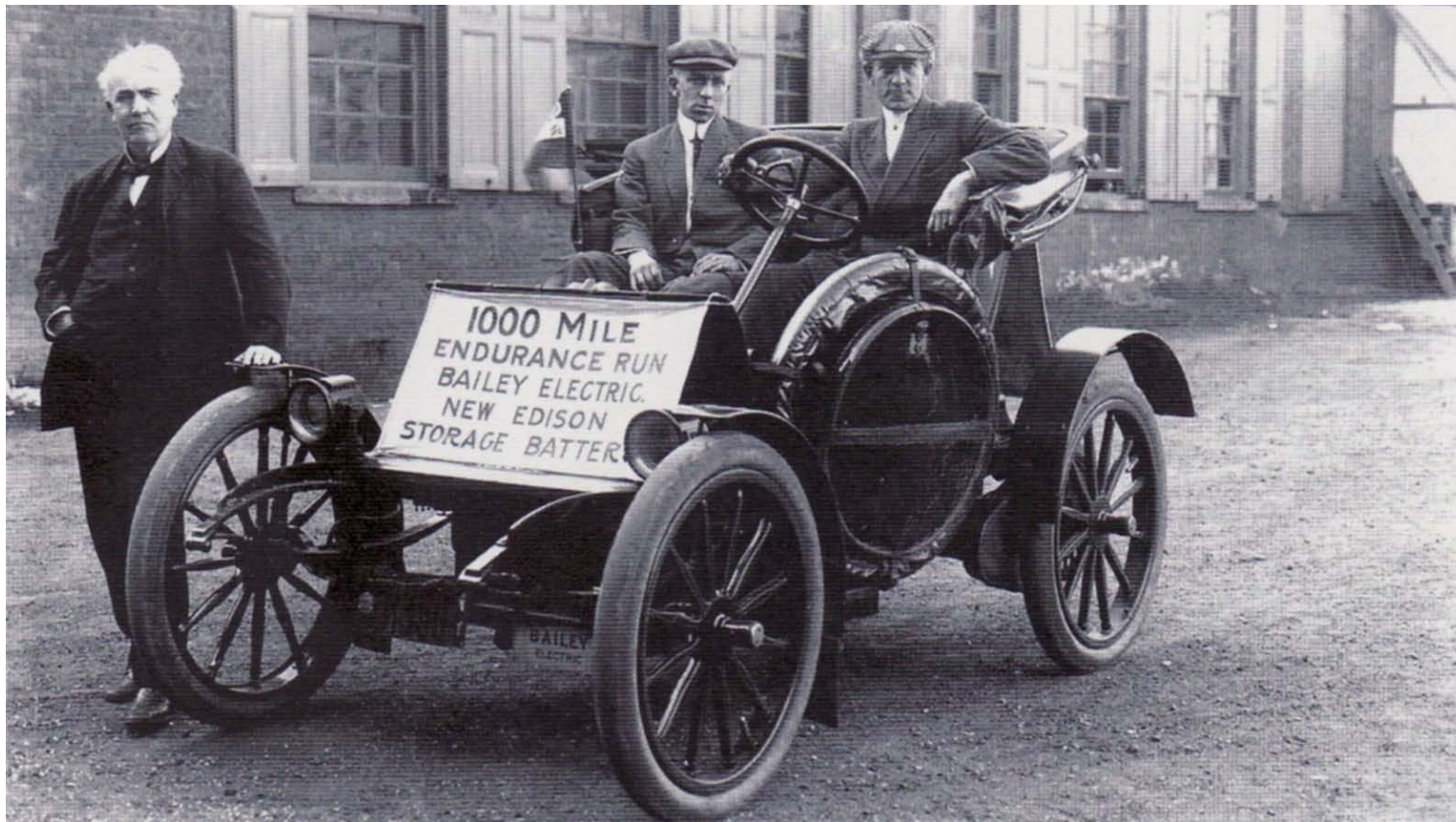
- Electrification of Vehicles – A 100 Year Old Vision
- Global Electrification
 - Main Drivers
 - Main Challenges
 - Consumer Acceptance of EVs and PHEVs
- Global Electrification - Roadmaps
 - G8, Canada, United States, Australia, European Union
- Government Initiatives & Policies
 - Canada, United States, Australia, Germany, Japan, South Korea, China
- Talison Lithium Limited – A Global Lithium Producer



3rd Lithium

Supply & Markets Conference

Electrification of Vehicles - A 100 year old vision



3rd Lithium

Supply & Markets Conference

Electrification of Vehicles - Still a current vision in 2011



3rd Lithium

Supply & Markets Conference



Global Electrification - Main Drivers

- Energy Security
- Peak Oil & Security of Supply
- Greenhouse Gas Emissions & Climate Change
- Environmental Sustainability of Fossil Fuels
- Scarcity of Raw Materials
- Population Growth & Demographic Change
- Urbanization & Mega Cities
- Traffic Congestion
- Pollution & Public Health
- New Technology
- Industrial & Economic Development



3rd Lithium

Supply & Markets Conference



Global Electrification - Main Challenges

- Lithium-Ion Batteries
 - Performance, Range, Charging Time, Lifetime, Cost, Safety & Recycling
- Smart Grid Technology
- Vehicle to Grid Interface & Integration (Power Generation, Transmission & Distribution)
- Charging Infrastructure
- Government Policies & Regulations
- Harmonization of International Standards, Policies and Regulations



3rd Lithium

Supply & Markets Conference



Global Electrification - Consumer Acceptance of EVs & PHEVs

- Driving Pleasure
- Style & Design
- Quality
- Comfort
- Performance
- Range
- Cost
- Individuality
- Personal Mobility
- Environmental Considerations



3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps

- Global Electrification of Road Transport is being given first priority by many Governments
- Each Government has unique priorities and unique approaches to electrification
- Consequently, there is a proliferation of Roadmaps, Reports, Papers, Studies & Programs
- Roadmaps are generally designed to advance clean energy economies:
 - To facilitate the development and deployment of clean energy technologies
 - To outline the vision of electrification, the challenges and the proposed next steps
- Roadmaps are prepared by:
 - Intergovernmental Organizations (G8 – International Energy Agency)
 - Government Organizations (Canada, Australia, European Union, United States)
 - Private Organizations (Electrification Coalition)



3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps (cont.)

- Roadmaps address a variety of issues, including:
 - Electrification Roadmaps
 - Technology Roadmaps
 - EV – PHEV Roadmaps
 - Infrastructure Roadmaps
- Challenges posed by the proliferation of Roadmaps:
 - Coordination & integration of government, industry and consumers
 - Global harmonization of regulatory and industry standards
- The following slides present a brief snapshot of some of the current Roadmaps



3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps (cont.)

- G8 Initiatives
- G8 Summit in Tokyo, Japan in July 2008
- Ministers from G8 countries, China, India and South Korea
- International Energy Agency tasked to prepare roadmaps
- Roadmaps designed to advance low-carbon technologies
- Developed in collaboration with government, industry and NGOs
- EV and PHEV Technology Roadmap published in 2009
- Identifies a detailed scenario for the evolution of EV and PHEV
- Helps in establishing a “big picture” vision for the EV/PHEV industry
- Ultimately, designed to assist in achieving the future outlined in the ETP BLUE Map scenario, whereby EVs and PHEVs contribute to an approximate 30% reduction in CO2 emissions by 2050



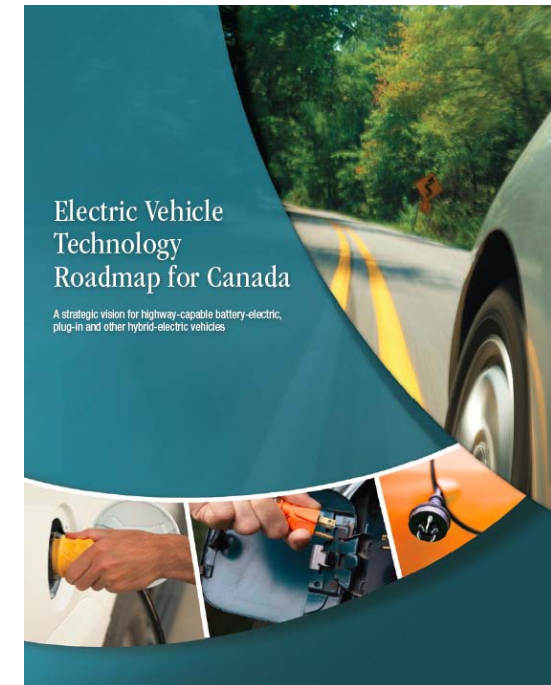
Technology Roadmap
Electric and plug-in hybrid electric vehicles

3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps (cont.)

- Canada
- Electric Vehicle Technology Roadmap for Canada
- Establishes the Strategic Vision for Canada's electric mobility:
 - 500,000 electric vehicles on Canadian roads by 2018
 - More Canadian content in parts and manufacture than today
- Canada is a world leader in renewable electricity generation
 - Hydroelectric sources account for close to 100% of electricity generated in 4 Canadian provinces
 - Canada is a leader in nuclear energy technology
 - Canada is the world's major supplier of uranium
- Canada must link its efforts with the United States due to the integrated North American automobile industry

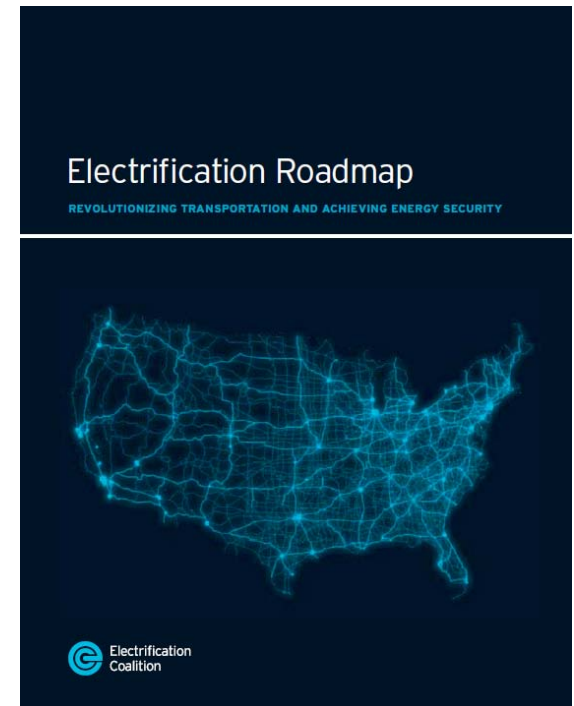


3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps (cont.)

- United States
- Electrification Coalition
 - A non-partisan and not-for-profit group of business leaders
 - Members from all sectors of the energy value chain
- Vision:
 - Achieve energy security and revolutionize transportation
- Activities:
 - Provide public policy research, analysis and guidance
 - Electrification Roadmap – Published in November 2009
 - Economic Impact of the Electrification Roadmap – Published in April 2010
 - Fleet Electrification Roadmap – Published in November 2010

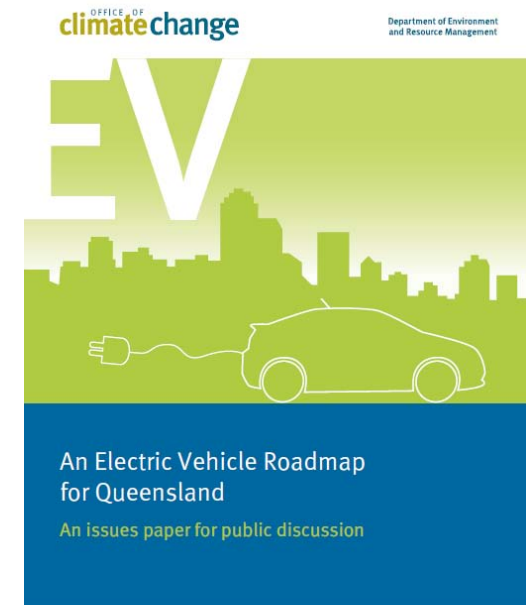


3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps (cont.)

- Australia
 - New Car Plan for a Greener Future
 - A\$1.3 billion Green Car Innovation Fund
 - State Governments are taking the lead:
 - Queensland State Government
 - EV Roadmap for Queensland – Published in June 2010
 - Facilitating the uptake of EVs as they enter Queensland
 - Planning to ensure infrastructure, industry and communities are prepared for transition to a lower carbon economy
 - Victorian and West Australian Governments introducing EV trial projects
 - Automotive Australia 2020 Vision Roadmap



3rd Lithium

Supply & Markets Conference

Global Electrification - Roadmaps (cont.)

- European Union
- European Green Cars Initiative
 - Component of the European Economic Recovery Plan
 - Multi-Annual Roadmap and Long-Term Strategy
 - European Roadmap – Electrification of Road Transport
 - US\$6 billion in funding
- Purpose:
 - Support research & development on technologies and systems to assist in achieving a green road transport system using renewable energy sources



European Green Cars Initiative

European Green Cars Initiative PPP
Multi-annual roadmap and long-term strategy

Prepared by the EGCI Ad-hoc Industrial Advisory Group



3rd Lithium

Supply & Markets Conference

Government Initiatives & Policies

- As noted earlier:
 - Global Electrification of Road Transport is being given first priority by many governments
 - Each government has unique priorities and unique approaches to electrification
- Consequently, each government is adopting a unique approach to its policy initiatives
- Government policy initiatives are extremely fluid, dynamic and constantly changing
- Policy initiatives are designed for either:
 - Supply side – industry participants
 - Demand side - consumers
- The following slides:
 - Provide a snapshot of some current government policy initiatives
 - Do not include industry initiatives and industry funding



3rd Lithium

Supply & Markets Conference

Canada

■ Lithium

- Supply: Limited domestic sources
- Target: No official Government policy / position

■ Electric Vehicles

- Target: 500,000 electric vehicles in 2018
- Policies: Canadian Electric Vehicle Technology Roadmap
- Funding: No specific funding committed

■ Batteries

- Target: Included in the Canadian Electric Vehicle Technology Roadmap
- Policies: As above
- Funding: No specific funding committed



3rd Lithium

Supply & Markets Conference

United States

■ Lithium

- Supply: Limited domestic sources (Chemetall)
- Target: Reliable access to critical materials

■ Electric Vehicles

- Target: 1 million electric cars on the road by 2015
- Policies: 2009 American Recovery and Reinvestment Act
- Funding: US\$25 billion to the electric mobility sector

■ Batteries

- Target: Dominant Global Player in Rechargeable Batteries
- Policies: Grants for Advanced Battery Manufacturing Facilities
- Funding: US\$2 billion



3rd Lithium

Supply & Markets Conference

Australia

■ Lithium

- Supply: Largest global resource of lithium minerals (Talison)
- Target: No official Government policy / position

■ Electric Vehicles

- Target: 1 million electric cars on the road by 2015
- Policies: Green Car Innovation Fund
- Funding: A\$1.3 billion

■ Batteries

- Target: No official Government policy / position
- Policies: No official Government policy / position
- Funding: No specific funding committed



3rd Lithium

Supply & Markets Conference

Germany

■ Lithium

- Supply: No domestic sources
- Target: EU Raw Materials Initiative

■ Electric Vehicles

- Target: 1 million electric cars on the road by 2020
- Policies: 2009 National Development Plan on Electric Vehicles
- Funding: €500 million for the electric mobility sector from 2009 to 2011

■ Batteries

- Target: Dominant Global Player in Rechargeable Batteries
- Policies: National Platform for Electric Mobility
- Funding: €500 million for the electric mobility sector from 2009 to 2011



3rd Lithium

Supply & Markets Conference

Japan

■ Lithium

- Supply: No domestic sources
- Target: Long term security of supply

■ Electric Vehicles

- Target: 50% next-generation vehicles by 2020
- Policies: Next-Generation Vehicle Plan 2010
- Funding: US\$6.8 billion in subsidies for electric and high-efficiency vehicles

■ Batteries

- Target: 2015: 50% performance improvement /seven fold decrease in price
- Policies: Roadmap for the Development of Next Generation Auto Battery Technology
- Funding: US\$55 million (2009)



3rd Lithium

Supply & Markets Conference

South Korea

■ Lithium

- Supply: No domestic sources
- Target: Long term security of supply

■ Electric Vehicles

- Target: 1 million electric cars on the road by 2015
- Policies: Tax incentives to buyers from 2010
- Funding: US\$2.7 billion over next 5 years

■ Batteries

- Target: Dominant Global Player in Rechargeable Batteries
- Policies: Battery 2020 Project
- Funding: US\$12.5 billion over next 10 years



3rd Lithium

Supply & Markets Conference

China

■ Lithium

- Supply: Several domestic sources (minerals & brines)
- Target: Long term security of supply (internal & external)

■ Electric Vehicles

- Target: 1 million electric vehicles on the road by 2015
- Policies: Revitalization Policy of Auto Industry / 13 City Pilot Program / 12th Five Year Plan
- Funding: US\$15 billion by 2020

■ Batteries

- Target: In support of EV policies
- Policies: 12th Five Year Plan
- Funding: RMB 6 Billion



3rd Lithium

Supply & Markets Conference

Summary

- Global Electrification continues to gain momentum
- Drivers for Global Electrification continue to underpin momentum
 - Energy security, greenhouse gases & urbanization
- Challenges for Global Electrification continue to be met
 - Battery power, range, lifetime and cost, continue to improve
- As a result of many governments giving Global Electrification first priority:
 - EV targets are being established
 - Roadmaps are being developed
 - Incentive frameworks are being implemented
 - Substantial funding is being committed to technology and infrastructure
- Industry is also committing substantial resources to Global Electrification



3rd Lithium

Supply & Markets Conference



Talison Lithium Limited

- One of the four leading global lithium producers
- Lithium mineral production assets in Western Australia
- Largest, highest grade global lithium minerals deposit
- Lithium brine exploration assets in Chile
- Largest global supplier of technical grade lithium concentrate
- Largest global supplier of chemical grade lithium concentrate
- Dominant position in the Chinese lithium concentrate market

