

NEW ENERGY

Connected E-Mobility

Nick Carter

Oct 2015

Energy in
action.®

Since 1837

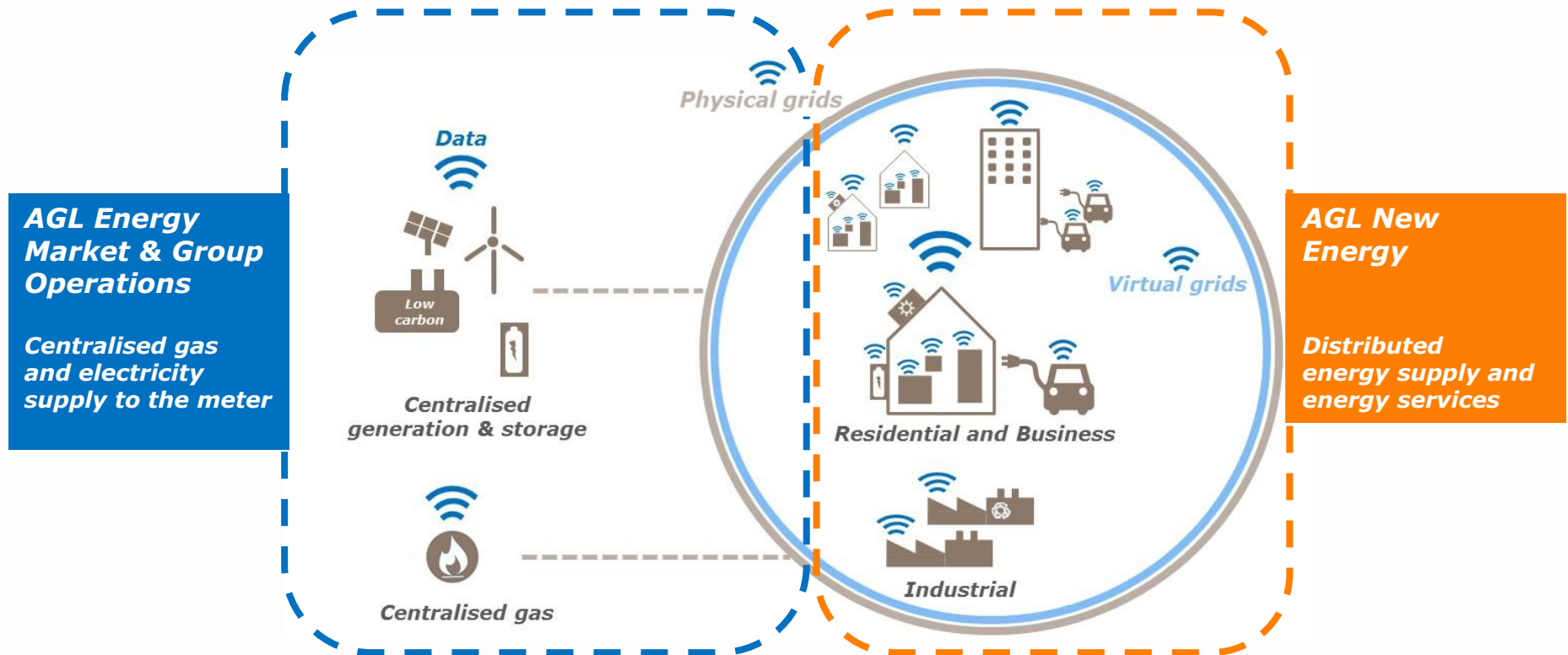
AGL



- » **New Energy – Role in AGL**
- » **PEV Market Growth – Market Size**
- » **PEV Products and Services – PEV Value Chain**
- » **PEV Business Models – EV Advantage, Energy Autonomy**
- » **Autonomous Vehicles – Disruptive Technology**
- » **Concluding Remarks – Close**

New Energy business group role

Playing key role in the transformation to a customer-driven energy market.



- > AGL New Energy – Mobility Services
- > Oct 2015

New Energy products.

Focusing on comfort, convenience and control for our customers.

4

NEW ENERGY

Create 1 million smart connections across homes and businesses by 2020

Become preeminent customer choice for Competitive and Connected energy products and services that provide Convenience, Comfort and Control

**Large Commercial
Distributed Heat & Power**

**Small Commercial
Distributed Heat & Power**

**Commercial
Service & Repair**

Transport LNG & CNG

Embedded Networks

Demand Response

Digital Metering

Distributed Generation

Energy Storage

Electric Vehicle Services

Home Energy Management

Emerging Technology

> AGL New Energy – Mobility Services

> Oct 2015

Energy in
action®

Since 1837

AGL

PEV Market Size



Energy in
action.®

Since 1837

 **AGL**

Australian PEV market will be large by 2030

Market drivers and indicators are on track

6

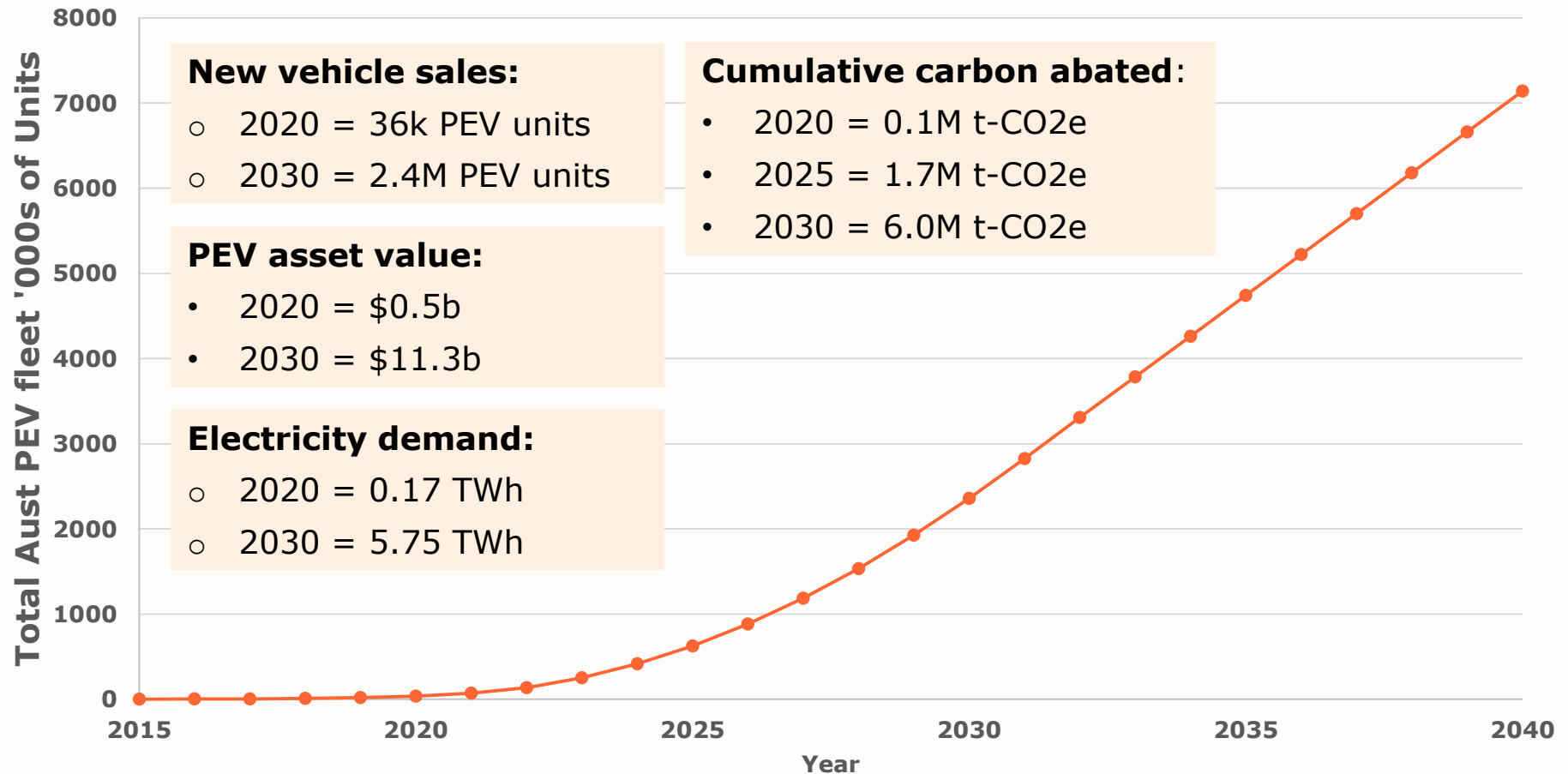
Global and Australian PEV markets are accelerating:

- » **Falling prices** – Battery prices dropping, volumes increasing
- » **More choice** – New vehicles and new players
- » **WoLC difference narrowing** – Cap-ex decrease with op-ex saving
- » **Driver acceptance** – 2nd-gen product with user experience
- » **Emissions abatement** – Zero tailpipe for clean air and zero lifecycle when using renewables

PEV market will grow to 2.4m vehicles by 2030

Early-adopter phase now but asset value will grow to ~\$11b by 2030

7



Source: Brown, CSIRO, AECOM, ESAA, AGL Modelling

> AGL New Energy – Mobility Services

> Oct 2015

Energy in
action.

Since 1837

AGL

PEV Products and Services

Energy in
action.®

Since 1837

 **AGL**

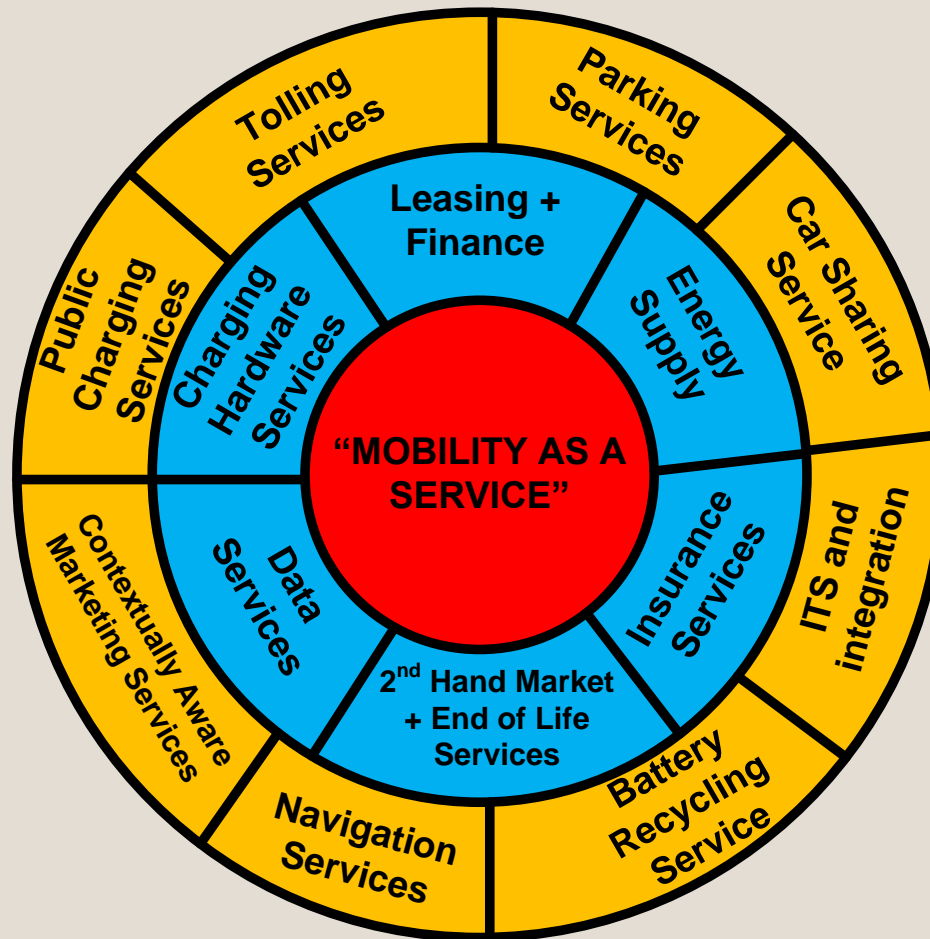


AGL EV services

Six core services

9

- Core services
- Non-core services



> AGL New Energy – Mobility Services

> Oct 2015

Energy in
action.

Since 1837

AGL

AGL EV Advantage

A one stop shop for your electric vehicle needs

10

- ✓ **Vehicle leasing**
- ✓ **Charging solutions**
- ✓ **Energy supply & systems**
- ✓ Promotion
- ✓ Reporting & certification
- ✓ Flexible finance



Realise the benefits for your business today.
Contact the AGL EV Advantage experts on **1300 713 477**
or email us **evadvantage@agl.com.au**

Energy in
action.®

Since 1837
AGL

Energy Autonomy

Oct 2015

Energy in
action.®

Since 1937

 **AGL**

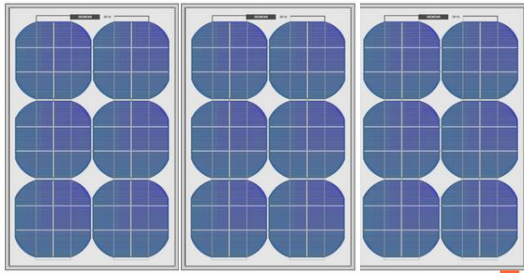


- » **Business Customers – Looking for a way to power PEV fleets with renewable locally produced energy**
- » **Business Resilience – Energy Security**
- » **Sustainability – Marketing and stakeholder engagement**
- » **Essential Services – Delivery at all costs**

Solar Powered Essential Services...

Innovative Energy Systems

13



Solar PV



Storage
Battery



Electric Vehicle

> AGL New Energy – Mobility Services

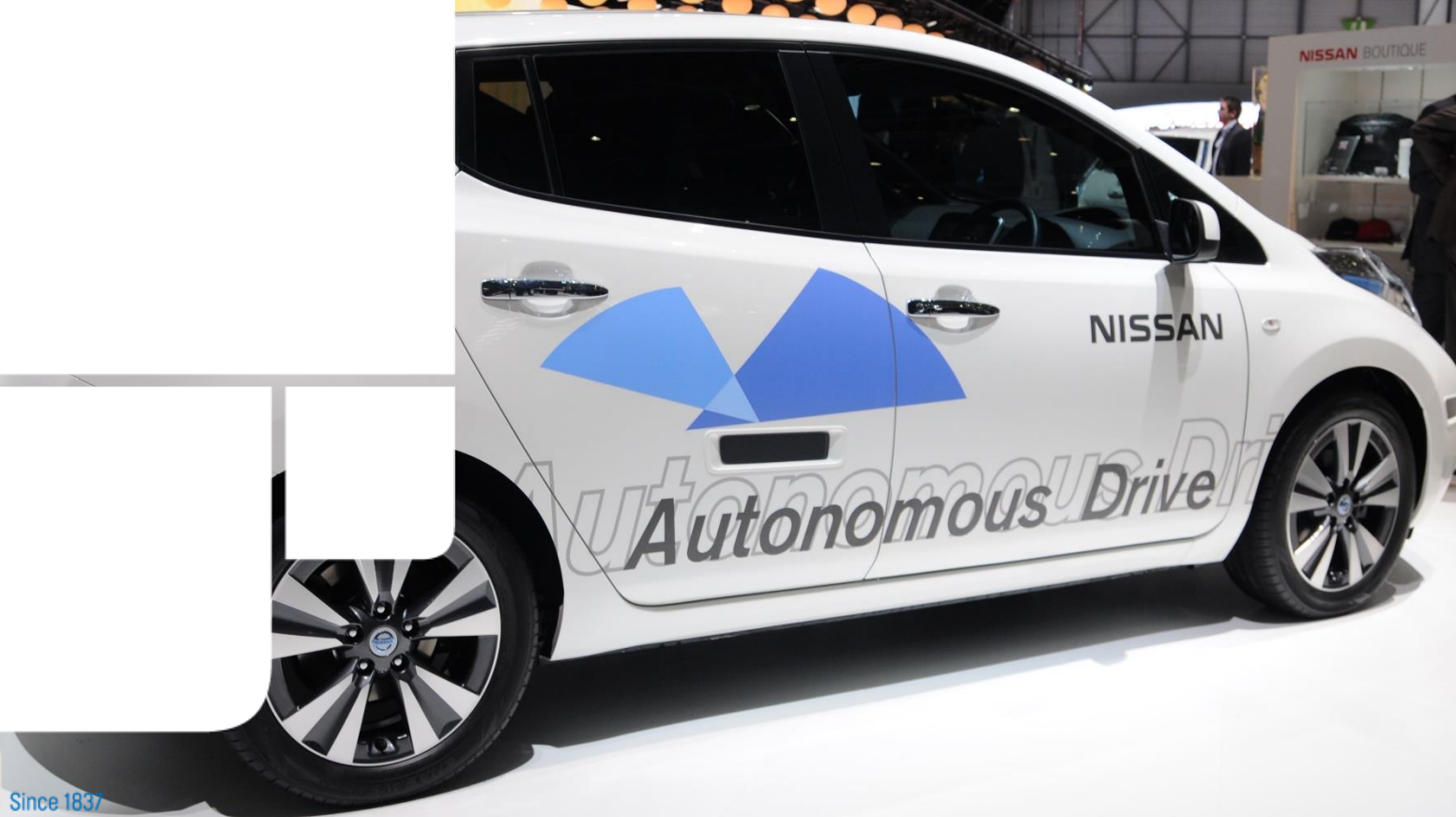
> Oct 2015

Energy in
action.

Since 1837

AGL

Autonomous Vehicles



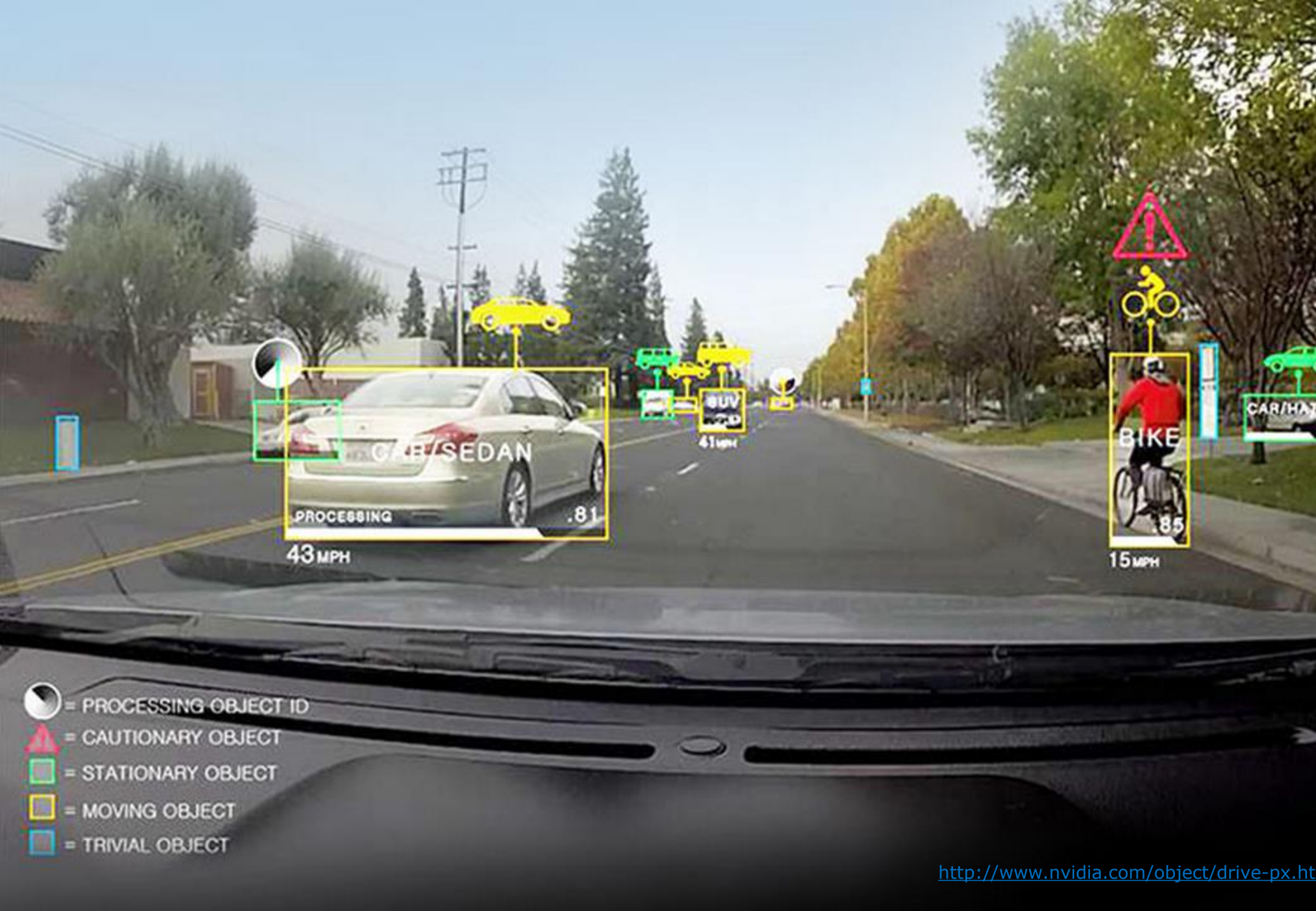
Energy in
action®






Since 1837

 **AGL**







-  = PROCESSING OBJECT ID
-  = CAUTIONARY OBJECT
-  = STATIONARY OBJECT
-  = MOVING OBJECT
-  = TRIVIAL OBJECT



Shared Autonomous Vehicles (SAVs)

9:1

traditional vehicles
displaced per SAV

8%

additional VMT
due to empty trips

Annual miles/vehicle

12,000

64,000 miles

Sedan

\$0.44

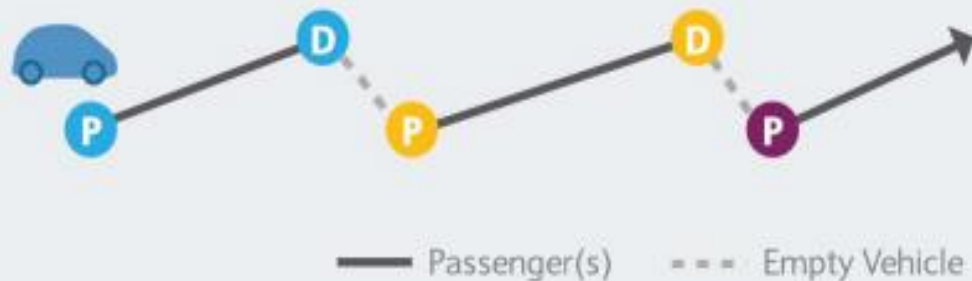
mile ride cost
to consumers per SAV

Two seater

\$0.16

mile ride cost
to consumers per SAV

Flow: "robot taxis" with average wait time of 1 min



Pooled Shared Autonomous Vehicles (PSAVs)

15-18:1

traditional vehicles
displaced per PSAV

40-50%

reduced VMT
due to shared rides

Annual miles/vehicle

12,000

64,000 miles

Sedan

\$0.21

per mile ride cost
to consumers per PSAV

Two seater

\$0.08

per mile ride cost
to consumers per PSAV

Flow: "perpetual ride" with average wait time of 5 min



Weighted Average Age of Fleet 14.4

91

percentage of vehicles
with emissions grade 1 or 2

80%

percentage of vehicles
with emissions grade 3 or 4

\$0.44

cost per vehicle
to meet emissions grade 1 or 2

Cost of vehicle repair to meet emissions grade 1 or 2



1. Emissions grade 1
2. Emissions grade 2

Weighted Average Age of Fleet 14.4

15 18

percentage of vehicles
with emissions grade 1 or 2

40 50

percentage of vehicles
with emissions grade 3 or 4

\$0.27

cost per vehicle
to meet emissions grade 1 or 2

Cost of vehicle repair to meet emissions grade 1 or 2



1. Emissions grade 1
2. Emissions grade 2

Vehicles in use
↓ 60%



23rd World Congress on Intelligent Transport Systems

23RD ITS WORLD CONGRESS 2016 MELBOURNE

10-14 OCTOBER 2016

www.itsworldcongress2016.com

**PARTNER
AND SPONSOR
OPPORTUNITIES**

MELBOURNE
AUSTRALIA



**MEET IN ASIA PACIFIC FOR THE WORLD'S LEADING TRANSPORT TECHNOLOGY EVENT
ACTIVATING GLOBAL MOBILITY SOLUTIONS**

HOSTED BY

itsaustralia
Intelligent Transport Systems

CO-HOSTED BY



ITS  AMERICA

Conclusion

Energy in
action.®

Since 1837



- » **PEV Market Set to Grow**
- » **Electricity Demand due to PEV moderate**
- » **PEV products and services the key**
- » **Energy Autonomy for PEV fleets of interest**
- » **Autonomous Vehicles – New opportunities**

AGL EV Advantage.

A one stop shop for your electric vehicle needs.

24

- ✓ **Vehicle leasing**
- ✓ **Charging solutions**
- ✓ **Energy supply & systems**
- ✓ Promotion
- ✓ Reporting & certification
- ✓ Flexible finance



Realise the benefits for your business today.
Contact the AGL EV Advantage experts on **1300 713 477**
or email us **evadvantage@agl.com.au**

Energy in
action.®

Since 1837

AGL

**Thank You
And
Drive On...**



Energy in
action.®

Since 1837

