MITSUBISHI MOTORS

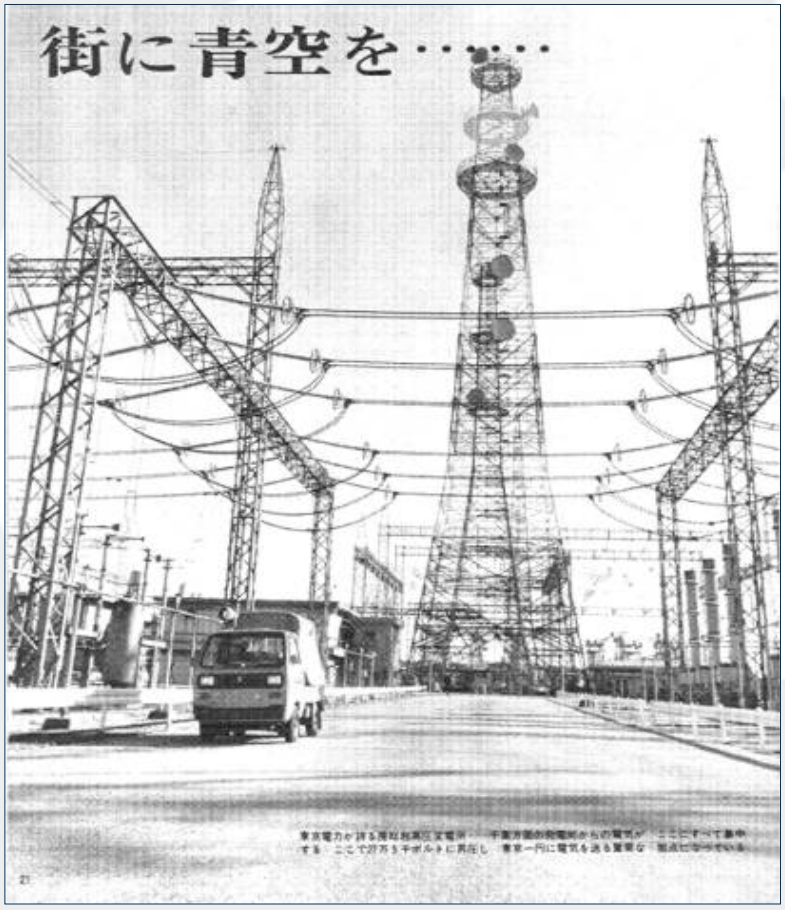
i MiEV - the product

November 2009

Naming

Mitsubishi electrical vehicle history

- First Mitsubishi Electrical vehicle was built in 1971
- We provided 150 EV's to power companies and the government



MINICAB EV

MINICA VAN EV

Mitsubishi Group's PR magazine; issued in 1972

Mitsubishi electrical vehicle history

1970 1980 1990 2000 2005 2010

Response to oil dependency

Response to Global warming

Response to Air Pollution

Minica EV

Mini Cab EV

Libero EV
(Lancer

FTO EV

Colt EV

Preparation for mass production

Delica EV

Minica Econo EV

ECLIPSE EV

Lead-acid Battery

Lithium-ion Battery

Environmental strategy Mitsubishi

1. Diversification of energy resources (Energy Security)

CNG vehicle

Readiness for bio-fuel (Ethanol FFV)

Green plastic

GREEN PLASTIC

FCV

Catalyst technologies

Restricted use of hazardous substances

i MiEV

Improved diesel performance

High-efficient transmission

PHEV

low-emission vehicles

Clearec

Weight reduction

Variable valve engine

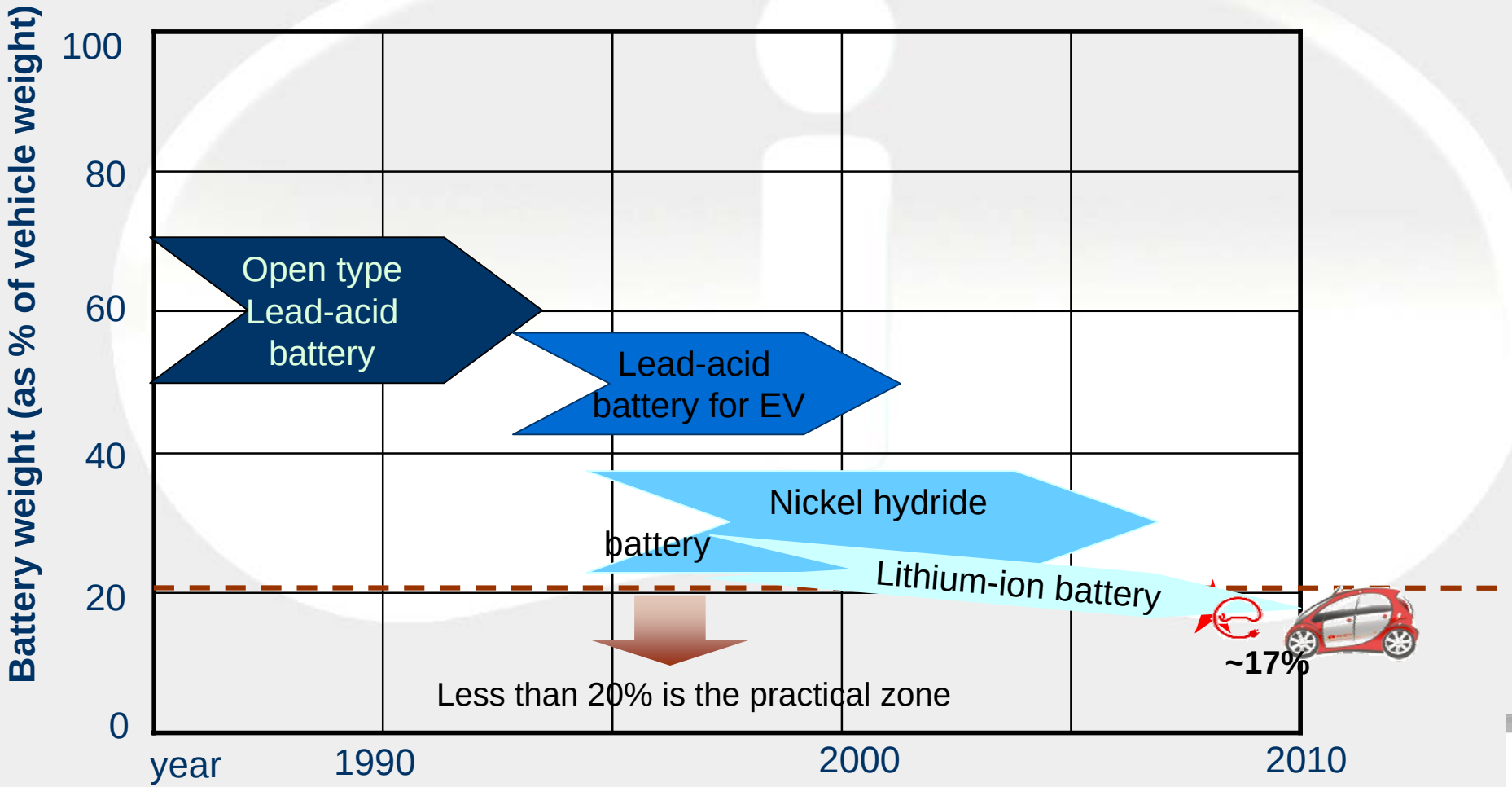
Variable displacement engine

3. Reduce Pollution

2. Reduce Global Warming

Battery development

- Battery weight as a percent of vehicle weight when calibrated for a driving range of 200km*

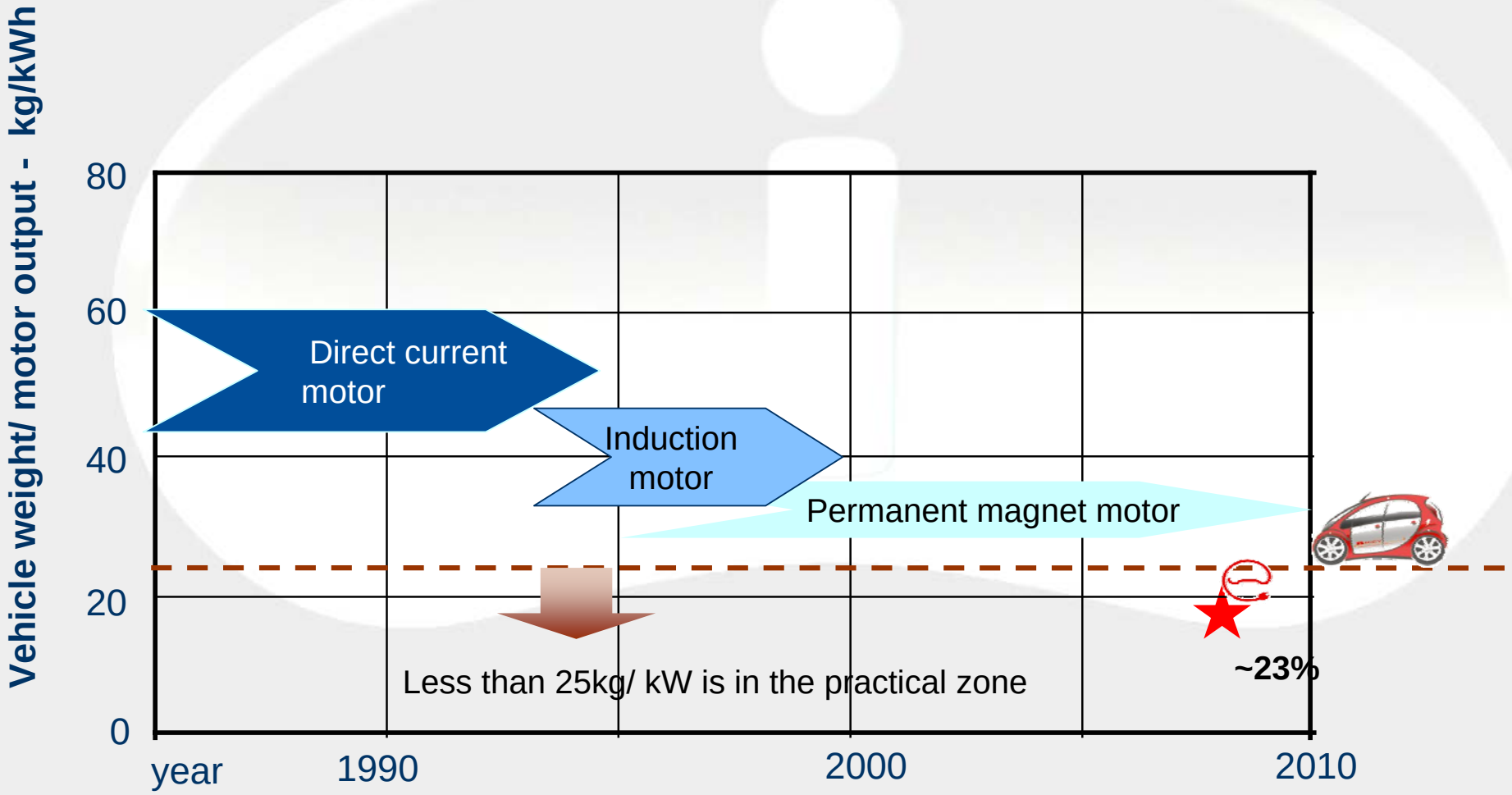


*Japan 10-15 mode




Engine development

- Power to weight ratio



Energy efficiency

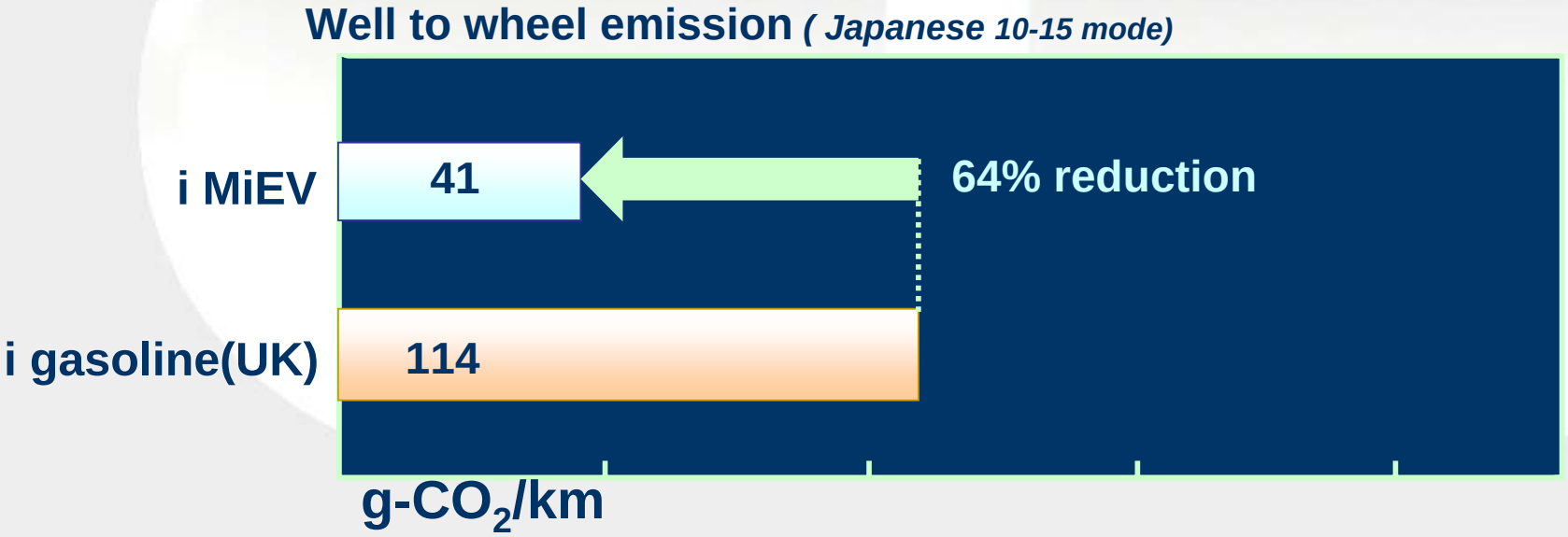
Well to wheel

	Well to tank	Tank to wheel						Overall
EV	42.9%*	*Charger 90%*	*Batt. 92%*	*Inverter 96%*	*Motor 91%*	*Mechanical 92%*	66,5%	**28.5%***
HEV (Gasoline)	82.2%	30.2%						**24.8%**
Diesel	88.6%	17.8%						**15.8%**
Gasoline	82.2%	15.1%						**12.4%**

**Calculation based on the share of Elec. Power source in Japan*

CO_2 emission

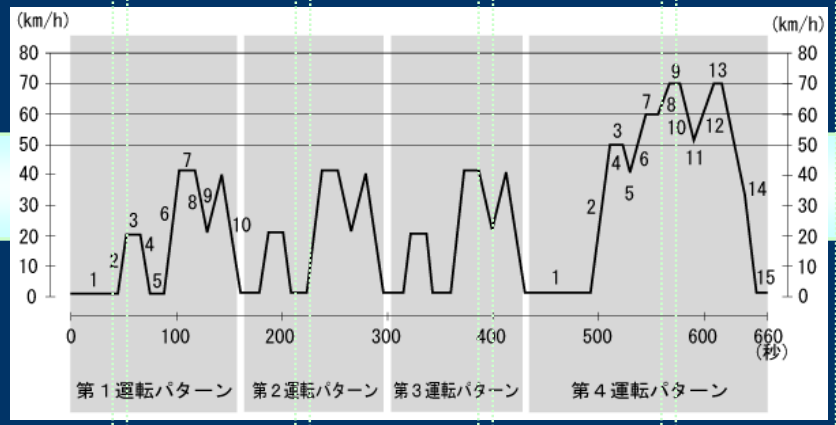
- CO_2 value of electrical vehicles is officially 0 g/km in Europe
- Electricity production does however create CO2
- Given Japanese energy mix, net CO2 reduction is 64%*
- Driving 10.000 km per year > 0,73 ton CO2 reduction



*Ref: JHFC Seminar 2005

Driving range

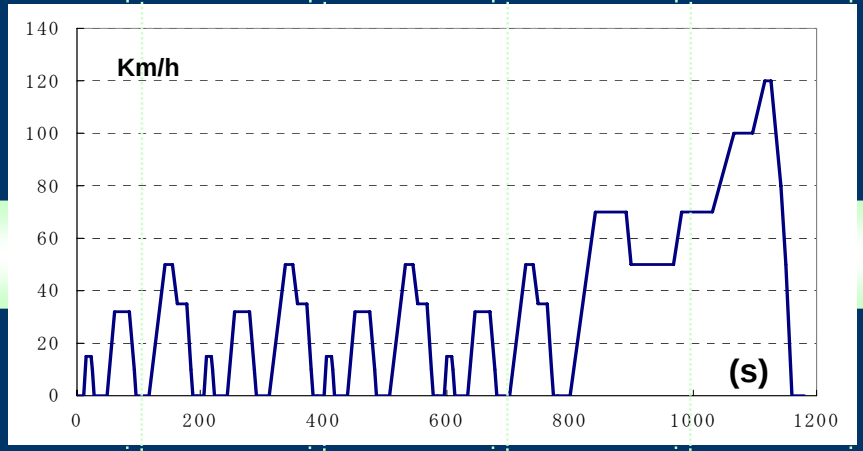
Japan 10-15 mode



160 km

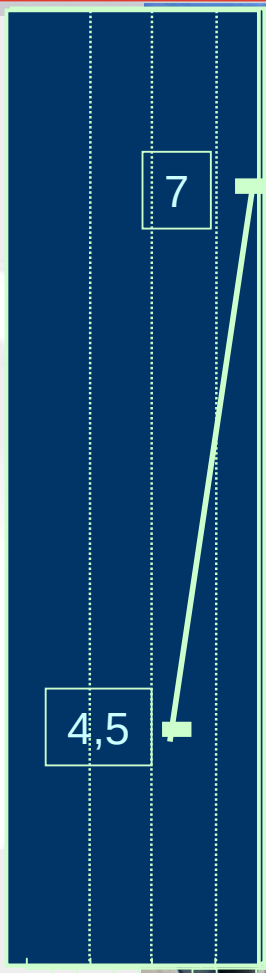
Average Speed 22.7km/h

EU mode



144 km

Average Speed 32.2km/h



0 20 40 60 80 100 120 140 160

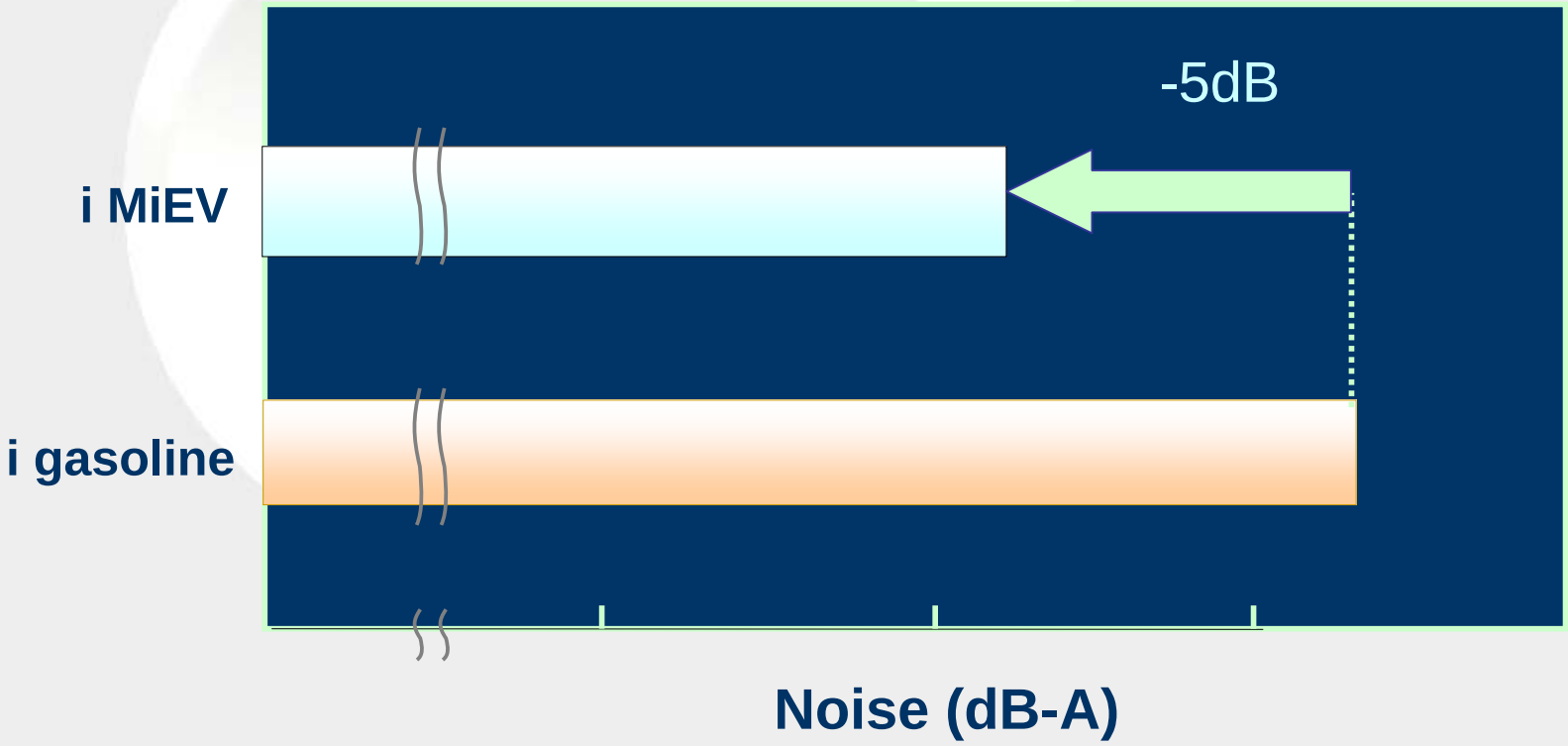
Driving Range(km)

2 4 6 8

Driving time (hour)

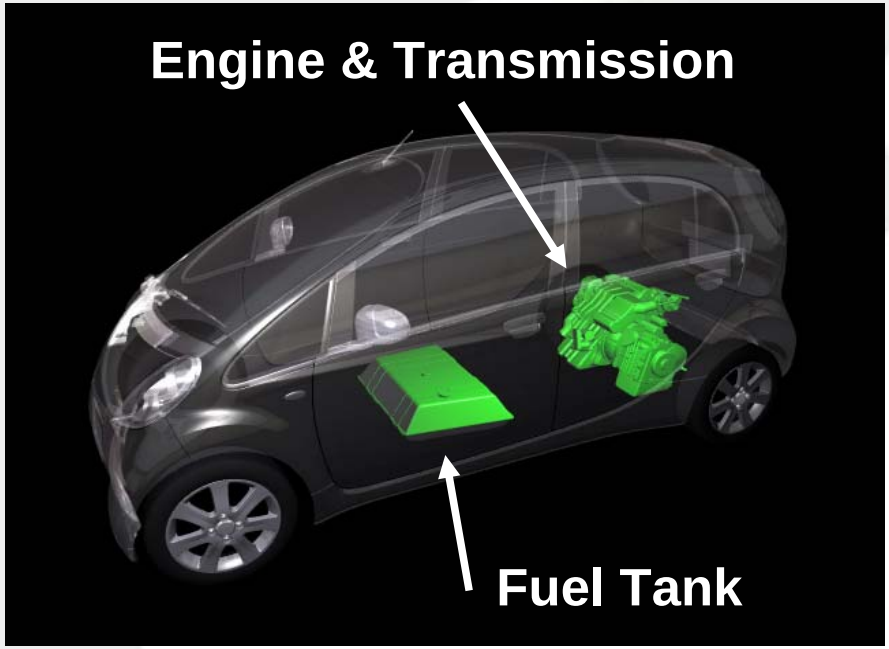
Noise level – outside vehicle

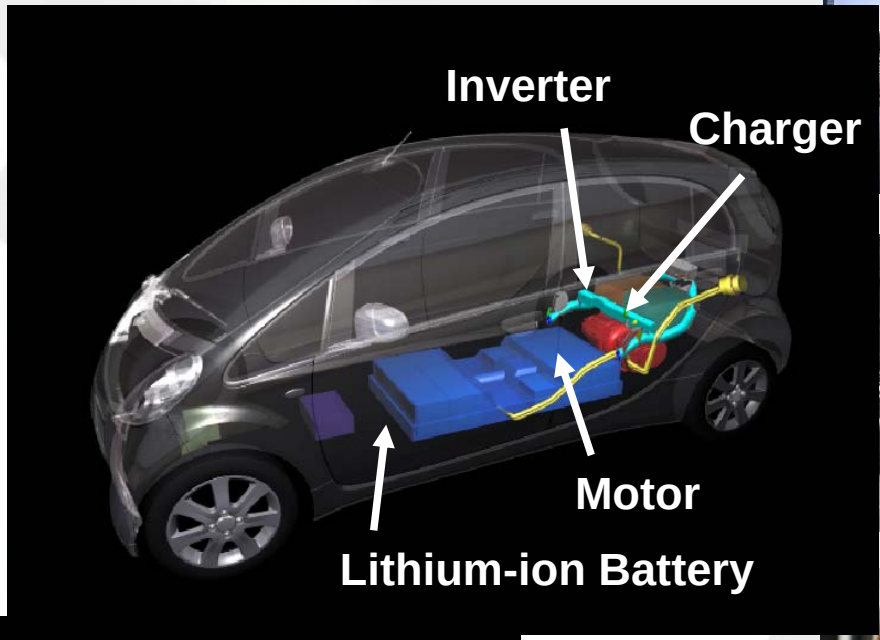
- Noise level decrease with 5 dB
  - When fully accelerating from 50 km/h
  - A 100% increase of sound volume equals (=) 3dB increase
  - EV can contribute to lower the sound pollution in big cities in Europe



MiEV Packaging

All EV components can be installed under the floor





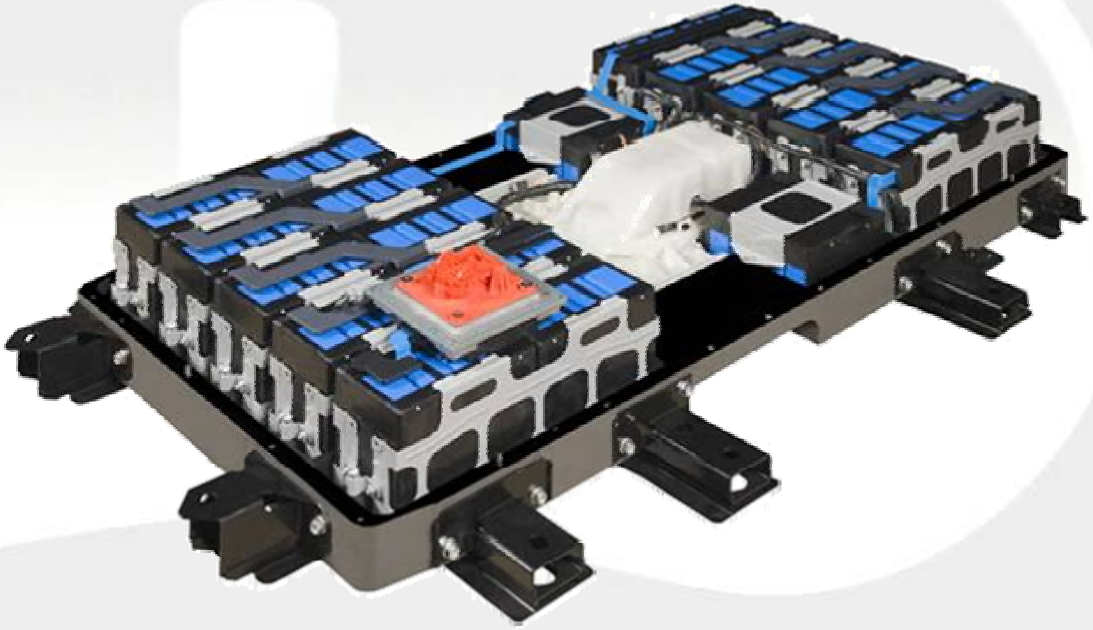
- ***Four adults can be seated***
- ***Cargo space is same as the gasoline i***

Lithium-ion Battery

- Battery module of 16KWh can be placed under the floor panel without further modification

88 x Cell

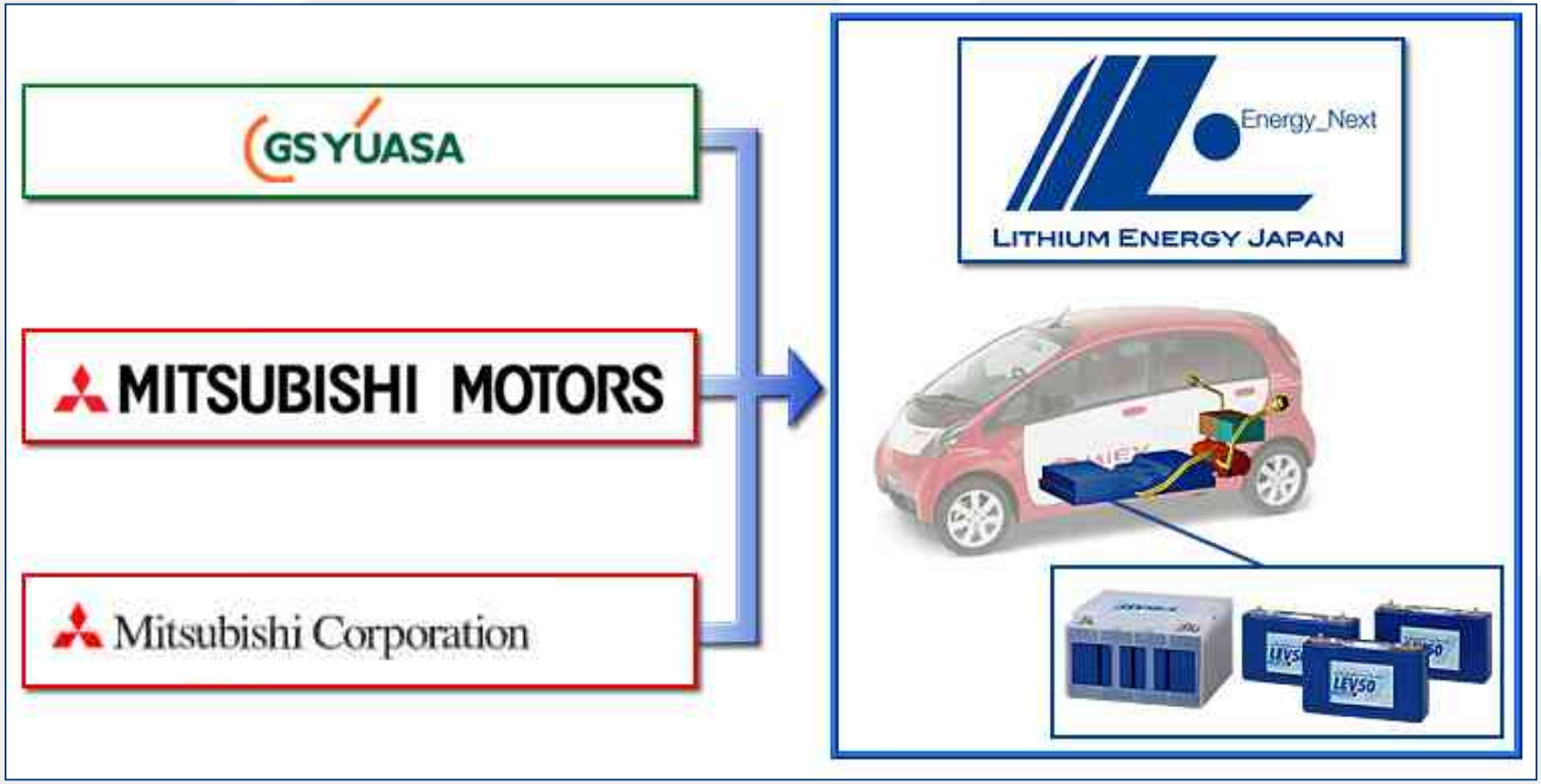
22 Modules



1 x Battery Package

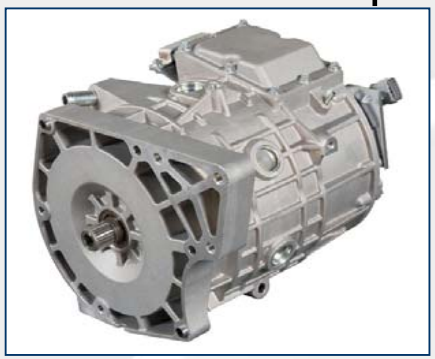
Battery Origin

- GS Yuasa, Mitsubishi Corporation, and Mitsubishi Motors Corporation established a Battery Manufacturing Company (Lithium Energy Japan) in December 2007.



Motor

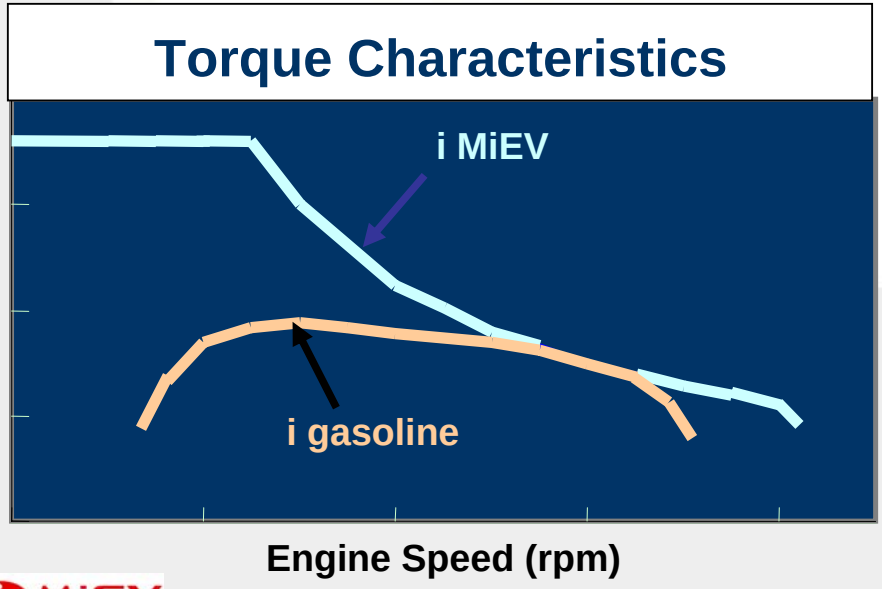
Small and quiet engine



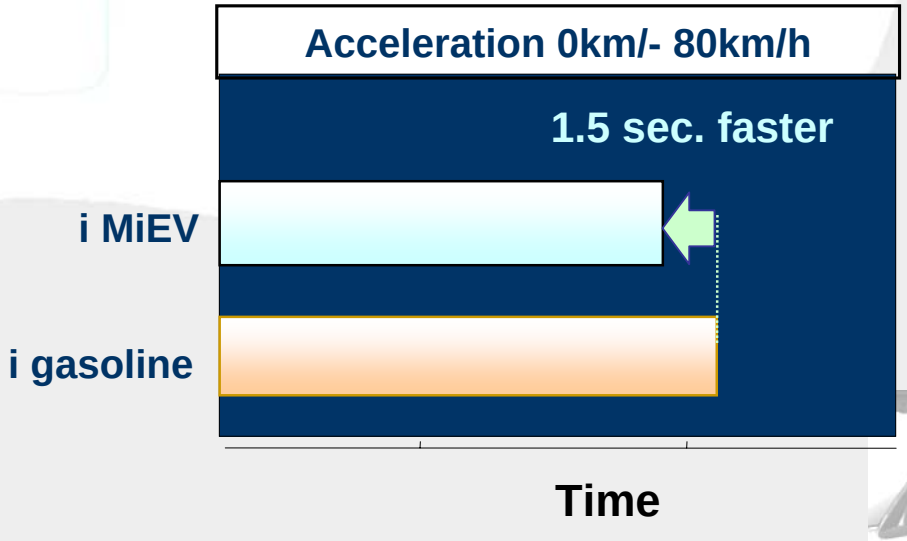
More torque

Data/ type	i MiEV	Gasoline
Max.Output	47kW	47kW
Max.Torque	180Nm	94Nm
Max.Speed	8500rpm	7500rpm
Type	Permanent magnet synchronous	Turbo-charged

Sporty character



Quicker acceleration

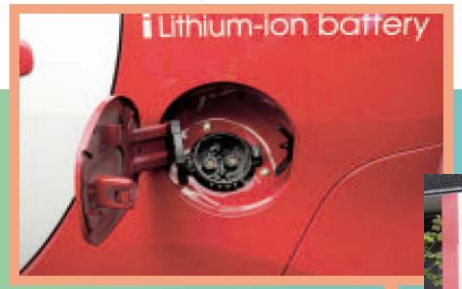


Charging

- Two ways of charging – quick and normal
- Normal charging at any regular plug in Europe
- Quick charging developed by Tokyo Electric Power Company (TEPCO) and Subaru, Nissan and Mitsubishi.
  - under development for Europe
    - Many manufacturers
    - Many electrical companies

Charging time	Power supply	Charging time
Quick charger	Three-phase 200V, 50kW	Approx. 30 min. (80%)
Household charger	230V (15A)	6+ hours(Full)

Normal socket

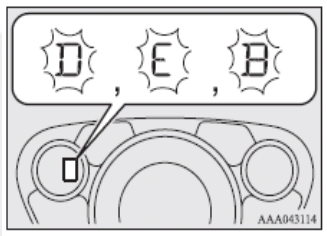


Quick charger socket

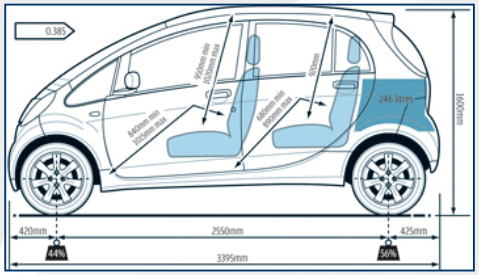
TEPCO Quick charger

Instrument panel & controls

- 3 positions for gear lever
  1. Drive – car functions as normal
  2. Eco mode – limits power output >> limits consumption. Light regenerative braking
  3. Brake – Strong regenerative braking – used for downhill driving



Specifications



Overall Length x Width x Height		3395 x 1475 x 1600 mm
Curb Weight		1080 kg
Seating Capacity		4
Max. Speed		130 km/h
Range (European cycle)		144 km
Motor	**Type**	Permanent magnet synchronous
	Max. Output	47 kW
	Max. Torque	180 NM
Drive System		Rear wheel drive
Battery	**Type**	Lithium-ion
	Total Voltage	330 V
	Total Energy	16 kWh

Road map of development

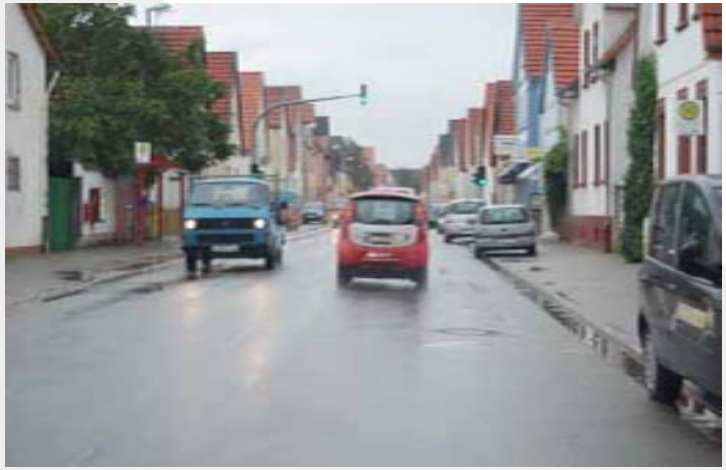
2006	2007	2008	2009	2010
Advanced Development Joint Research with Power Companies in Japan	**Joint Research** Tokyo, Kyushu, Chugoku	Sales Launch (Japan) **Fleet Test Japan** Tokyo, Kyushu, Chugoku, Hokuriku,Kansai, Hokkaido, Okinawa	Sales Launch Europe RHD **Fleet Test Europe, US**	Sales Launch Europe LHD

MRDE Testing in Europe 1- Impressions

- In EU the testing of i MiEV is now on the way

Public charging in London

Drive in the London inner city area



Daily drive in Trebur (near MRDE)

Charging under cold conditions

MRDE Testing in Europe 2- Impressions

Winter test in Norway

Darmstadt City drive

TO BE CONTINIUED…

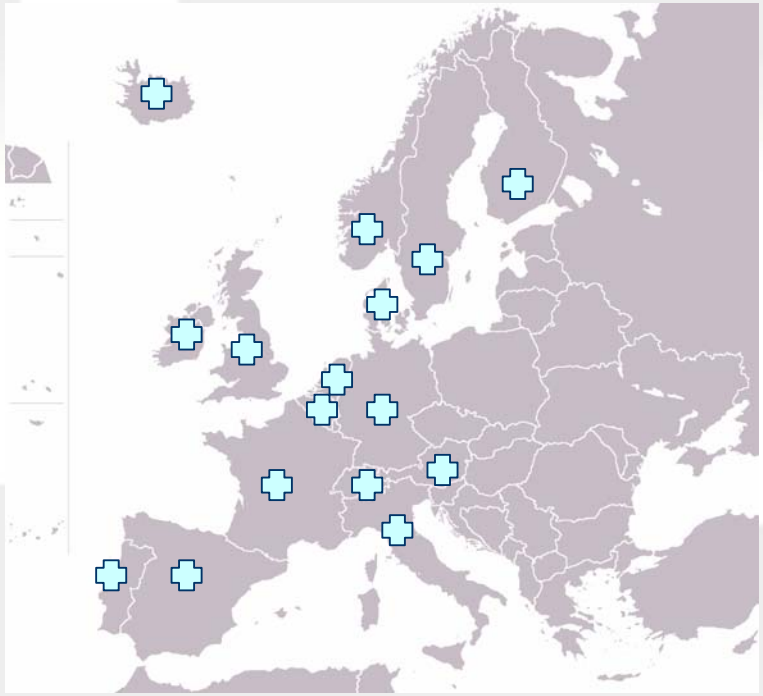
The vehicle at the MRDE- premises

Drive in Island

European fleet test

- 11 vehicles
- Used for fleet test in several countries throughout Europ
- Several vehicles for a few months per country
- Preparation for launch I MiEV
- Proto types
- Objectives
  - Promote Electrical vehicles
  - Test drives for
    - Governmental parties
    - Business customers
    - Consumers
  - European conditions
    - Driving style
    - Weather
    - Road
    - Reliability

x11



Pricing

- Low volume >> high parts price
- Ramp up costs
- Development costs
- Restricted demand

Total cost of ownership EV

- Higher volume
- Acceptance consumer
- Infrastructure
- Market size

Total cost of ownership petrol car

Cost

2009

Time

EV organization & roles

OEM's

- Vehicle supply
- Deliver attractive & finished product
- Getting people known with product (test drives)
- Utilize PR power

Governmental parties

- Subsidies
- Usage benefits
- Internal procurement adjustment
- Stimulate public-private cooperation
- Target setting on EV share

EV

Utility companies

- Infrastructure
  - Building
  - Maintenance
- Energy supply
- Billing structure

Institutes/ Universities

- Knowledge creation
- Knowledge sharing
- Drive technology forward (I.e. battery improvement)
- Define quality standards

Collaboration with Utilities in USA

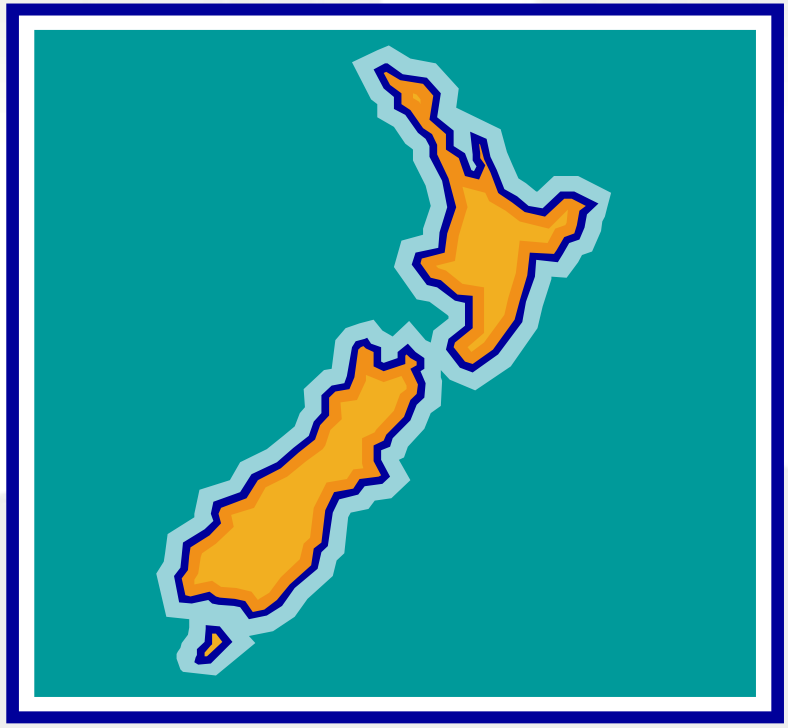
- Mitsubishi Motors Corporation to provide i MiEV Electric Vehicles to “Southern California Edison” and “Pacific Gas and Electric Company” for Joint Testing and Evaluation

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

PG&E Pacific Gas and Electric Company®

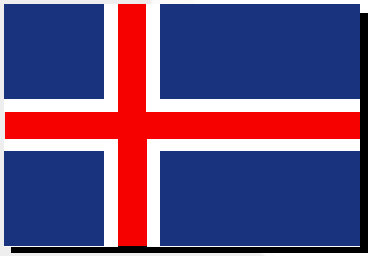
Collaboration with Meridian Energy in New Zealand

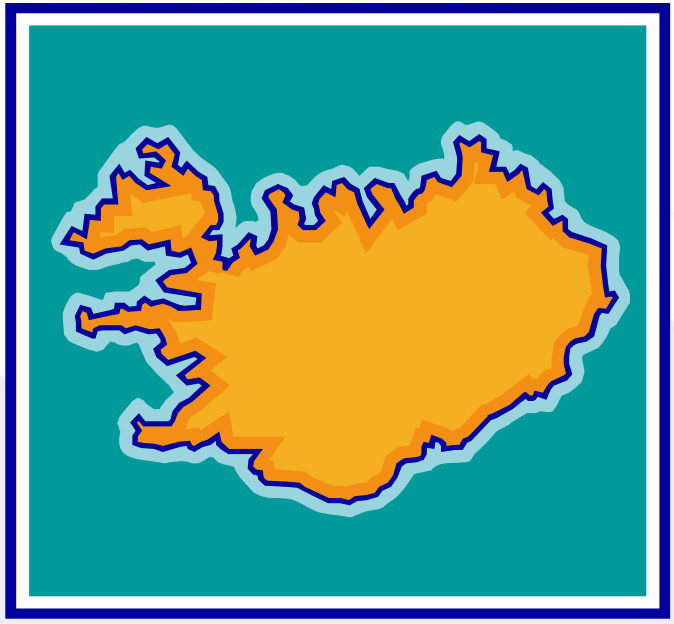
- Agreed with Meridian Energy Limited, which is the largest power company in New Zealand, to promote and demonstrate pure electric vehicle named as i MiEV on September 16th .



Collaboration with Iceland

- Agreed with Iceland, which is mainly utilized for geothermal energy in the country, to promote and demonstrate pure electric vehicle named as i MiEV on September 19th 2008.





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