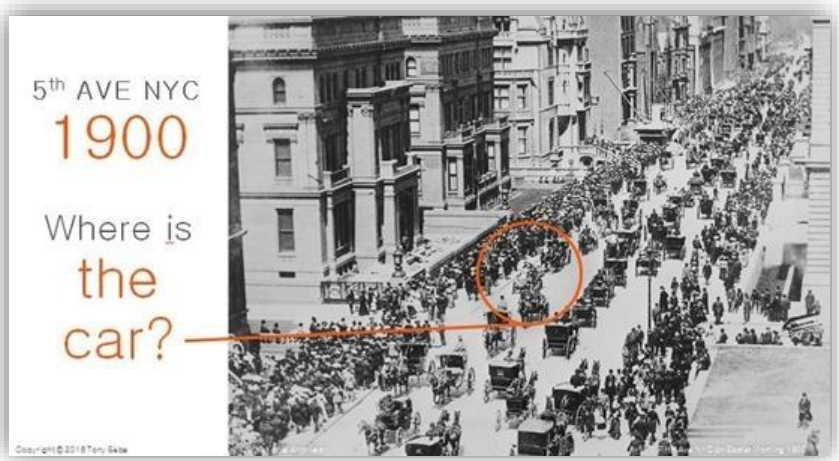
EDISON MOTORS' Future Eco-friendly Car Strategy

2021. 09. 07.

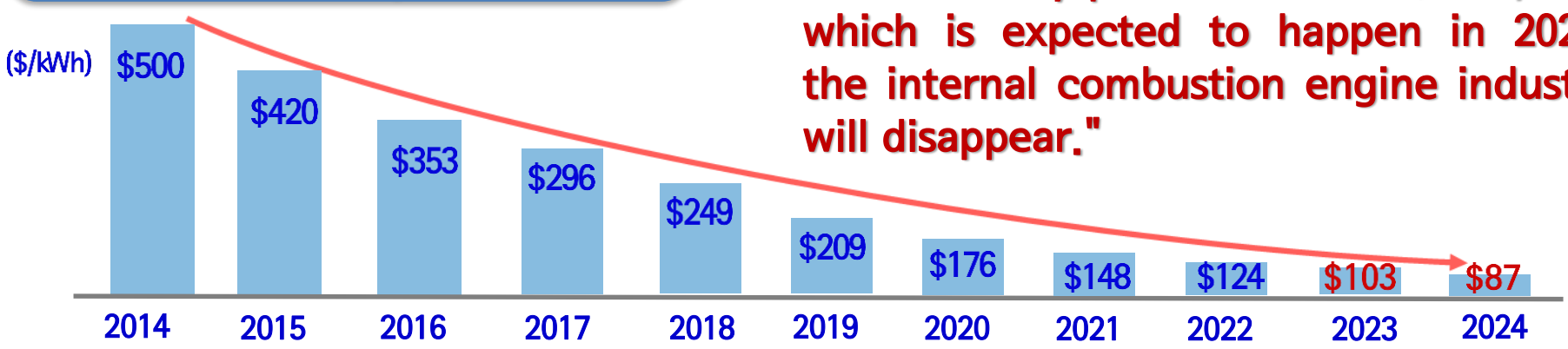
EDISON MOTORS

1. "2030 Clean Disruption of Energy and Transportation" by Tony Seba

- **"In 2030, all new cars will be EVs."**
- **"NY's 5th Avenue was full of horse carriages in 1900, but with only one car. In 1913, the same place was covered with cars."**



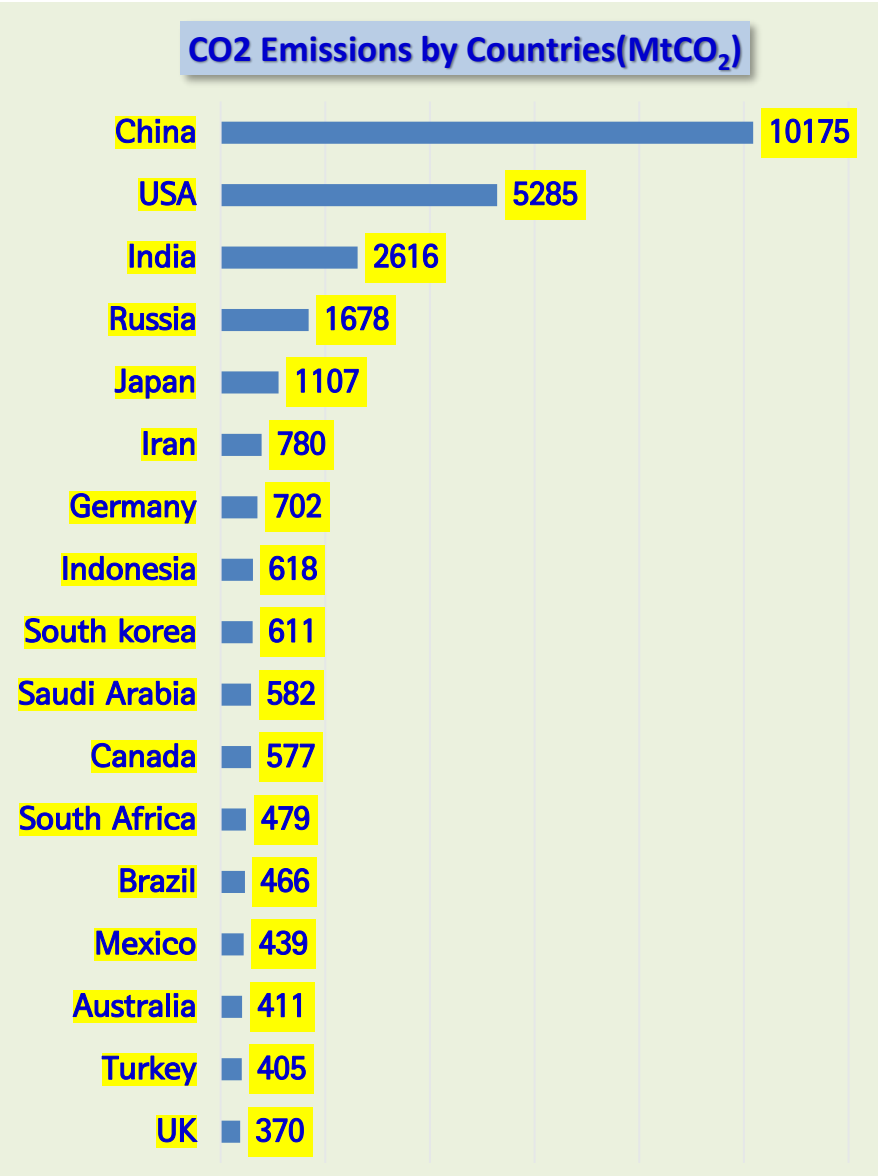
EV Lithium Battery Price Trend



"If EV battery price reached U$ 100/kWh, which is expected to happen in 2024, the internal combustion engine industry will disappear."

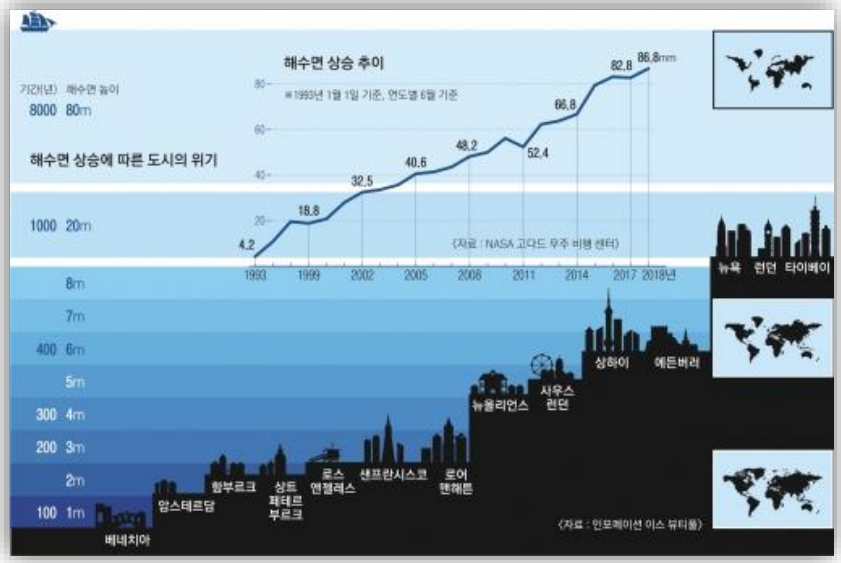
2. GCP Global CO2 Emissions in 2019: 34 Billion Tons

- The 'Global Carbon Project', an international scientific collaboration that has been tracking greenhouse gas emissions, announced that "CO2 emissions in 2019 were 34 billion tons.
- Due to the containment policy in response to the COVID-19, CO2 concentration has decreased by 7% compared to 2018, but it is at an all-time high
- China emits 10.1 billion tons, 28% of the world's CO2 emissions, the world's first; The United States, which emits 5.2 billion tons, is second; India, the third, emits 2.6 billion tons, and Korea, the ninth, emits 600 million tons.
- Although the use of renewable energy such as solar and wind power is increasing and energy efficiency is improving, it is not able to keep up with the increase in demand for fossil fuels such as cargo transportation, personal vehicles, ships, and aviation.



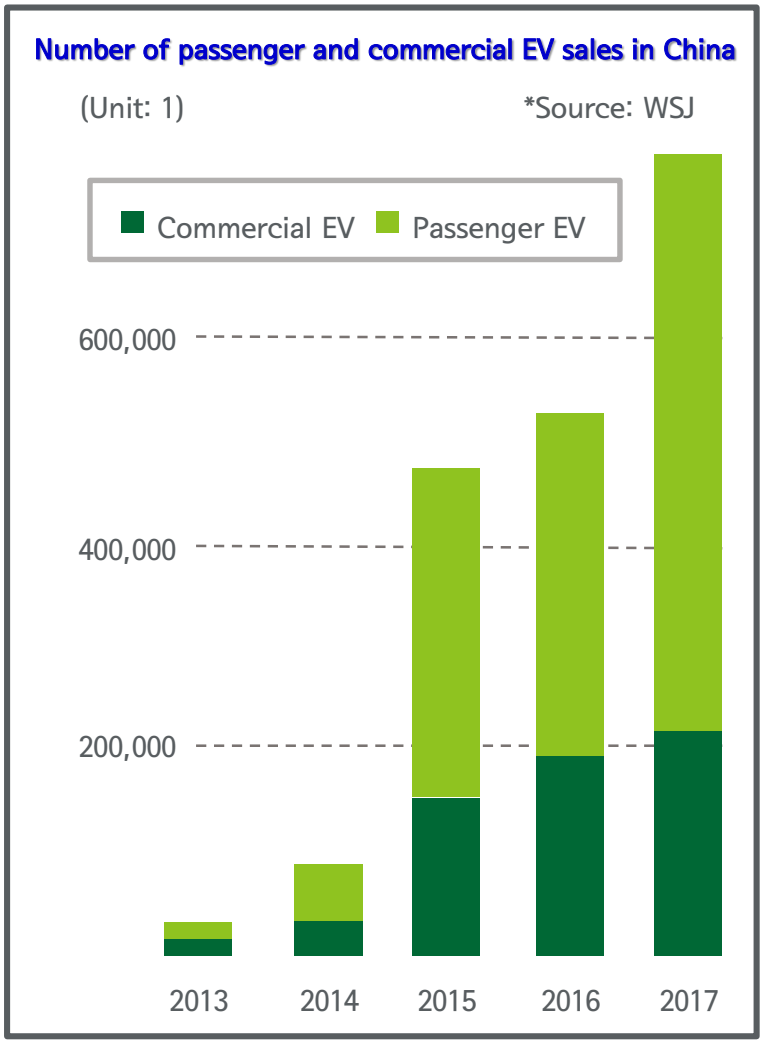
3. 4 Times' Faster Greenland Glacier Loss

- The recent drastic global warming expedites glacier loss in Greenland, 4 times faster after 2003. (See Leonardo DiCaprio's 'Before the Flood')
- Antarctic glacier loss has increased 6 times more in the last 40 years. (by Ohio State University research team)
- All Greenland glacier loss will cause 6.5m of sea level rise, and Antarctica's 7.3m rise.
- If sea levels rise by 1m in 100 years, Italy's Venice, famous for its water city, 3m rise will lock Hamburg, Germany, Amsterdam, Netherlands, and Manhattan, New York, U.S., and Shanghai, China, if it rises 6m, is also predicted to be submerged.Shanghai is also expected to be underwater, when the sea level rises by 6 meters 400 years later.
- If carbon emissions continue as they are now, experts predicted a 2-degree increase in global temperatures by 2100, but they estimated that it would rise from 4 degrees to 6 degrees to 8 degrees... SAS MERSC COVID-19 has led to the need to wear masks, and it is expected to be worse.



Urban crisis due to rising sea levels: infographic

4. Chinese Campaign by State-led 'EV Rise'



❖ China provided about U$ 16 Bn subsidy for eco-friendly cars from 2013 to 2020.

- EV is the core of China's 'Manufacturing 2025' project (WSJ on Dec 2, 2018)
- In 2016, China provided subsidies for 115,000 electric buses, which amounted to 45% of its sales price(Korea provided subsidies for only 100 buses.)
- China is in a state-led 'EV Rise'(The key person is Wan Gang, who is called the Zhuge Liang of China auto industry)
- Even if per unit subsidy decreases, Korean government needs to increase the number of e-buses to be subsidized to at least 3,000 units of EV bus to boost its domestic industry(Korean government subsidized 500 units in 2019, 650 unites in 2020, and 1000 unites in 2021)

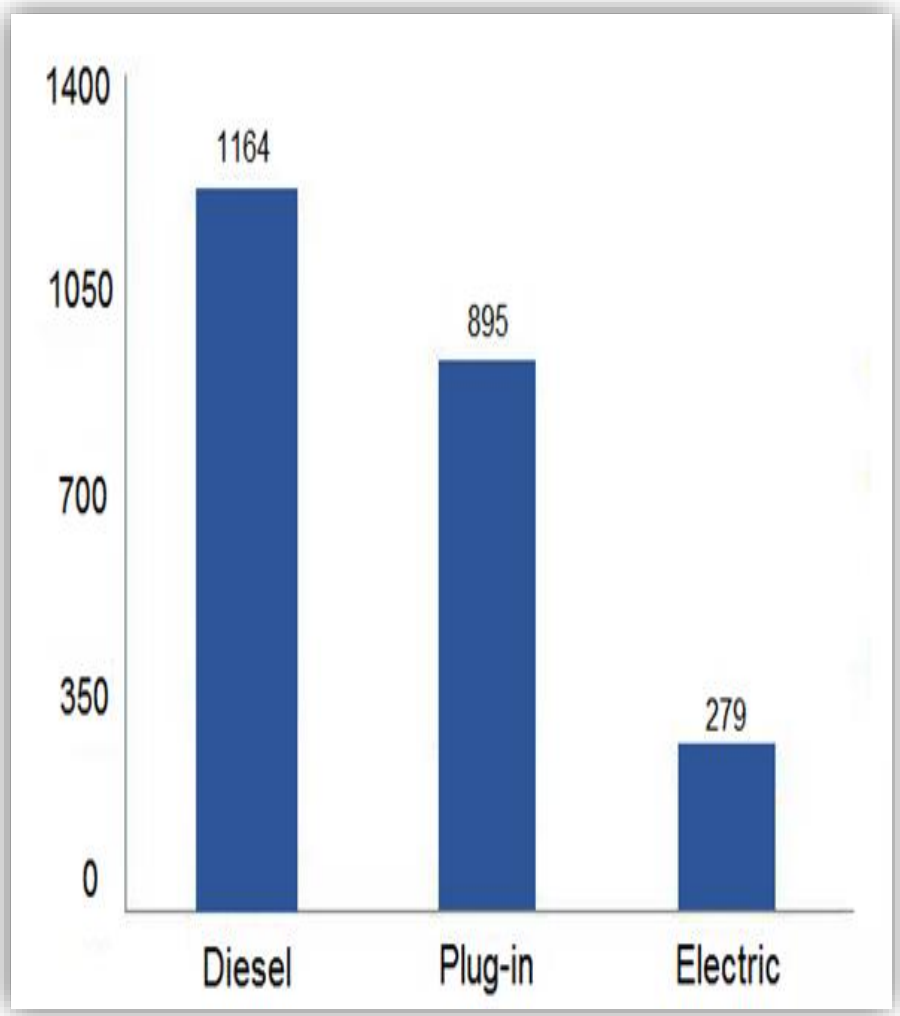
5. Technical & Philosophical Obstacles & Biased View

- 'Business entry barrier' is very high in the automobile industry.
- Need to design, produce and market extremely complex technologies, meet complicated regulations and requirements, and do all these things much better than the global giants who have been in the industry for 100 years.
- 'The technical obstacles' that demand manufacturers to make properly performing cars at reasonable and affordable prices.
- Like Tesla's founders, 'there are entrepreneurs who are doing businesses to contribute to the public benefit rather than making money'. However, the problem is that the world is always looking at them with a biased view, which can be called 'philosophical obstacles'.

Tesla Motors
Charles Morris

6. EV Reduces 75% Emission

- The annual emission of diesel vehicles is 1,146kg. In comparison, electric vehicles emit only 279kg annually, amounting to a 75% reduction in emissions.
- Taking the CO2 vehicle emissions in 2013 as a baseline, by 2017, about 8.56 M tons of CO2 were reduced due to the increase in new energy buses.
- In order to promote the development of new energy vehicles, the central and local governments of China are offering a series of incentives such as subsidies and tax reductions (about 156.1 Billion USD in subsidies paid for 11 years from 2013 to 2020).

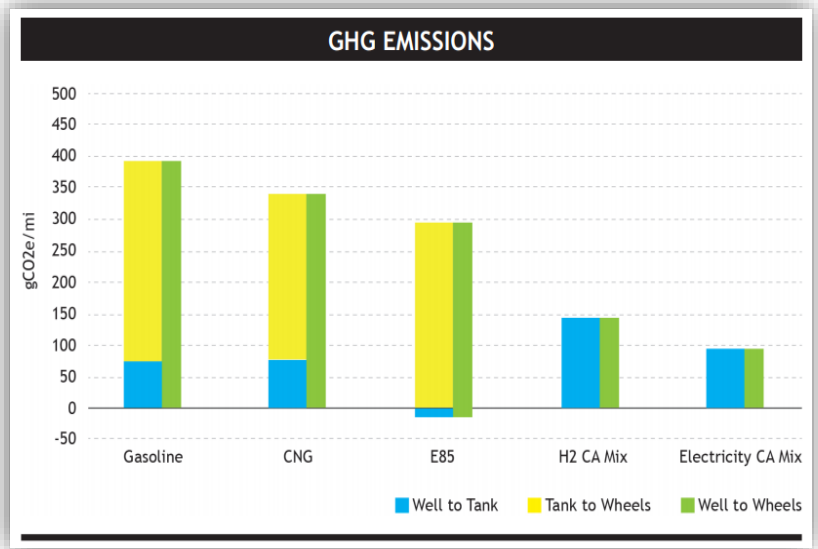


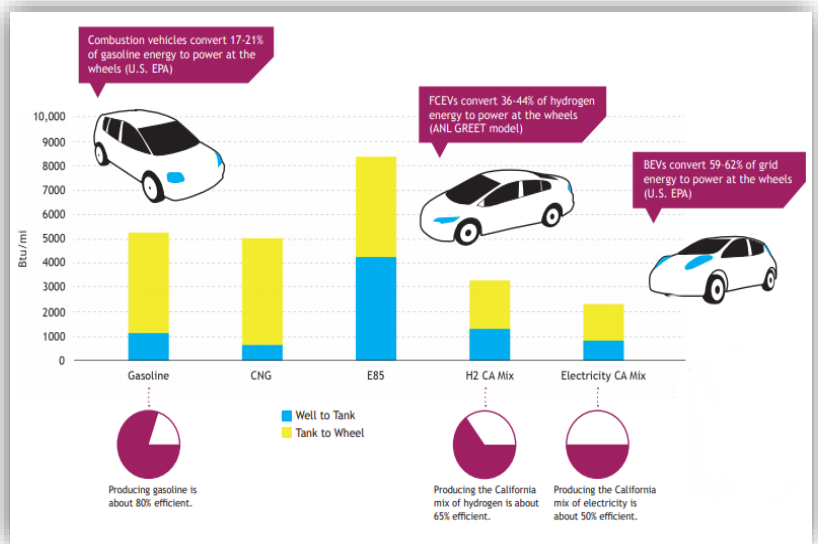
Source: Study on Demonstration Promotion and Business Model of New Energy Buses(China)

7. EV VS FCEV

- California is the place where FCEVs are most popular around the world.
- FCEV's CO2 emission has been assessed to be 150g per mile, which is around 33% more than BEV. (assessed by California Fuel Cell Partnership)
- FCEV transfers 36~44% of hydrogen energy to drivetrain, while BEV does 59~62% of electric energy to wheels.
- 'FCEV consumes around 30% more energy than BEV' to drive the same distance.

Source : A guide to understand the well-to-wheels impact of FCV (California, USA)





8. CO2 Emission Reduction by 33million Tons in China

Year	No. of Vehicles (10,000)	Vehicle Composition					Total Operating Mileage（100 million km）	CO2 Emissions per 10,000 cars (10,000 tons)	CO2 Emission Reduction (10,000 tons)
		Diesel	Natural Gas	Petrol	Hybrid	Electric			
2013	50.96	59.30%	24.30%	3.40%	0.50%		348.96	63.28	0.00
2014	52.88	52.90%	30.20%	2.50%	6.73%		346.69	62.68	31.81
2015	56.18	45.10%	32.50%	1.70%	15.50%		352.33	60.38	163.33
2016	60.86	37.20%	30.50%	1.40%	11.50%	15.60%	358.32	55.67	463.57
2017	65.12	28.70%	27.90%	1.00%	13.20%	26.30%	361.32	50.14	855.59
2018E	69.25	21.05%	25.60%	0.65%	13.20%	37.00%	364.32	44.02	1333.61
2019E	73.63	13.40%	23.30%	0.30%	13.20%	47.70%	367.32	37.08	1929.50
2020E	78.30	5.75%	21.00%	0.00%	13.20%	58.40%	370.32	30.08	2599.75
2021E	83.26	0.00%	17.70%	0.00%	13.20%	69.10%	373.32	23.55	3308.37

❖ Given the trend of fossil fuel cars being replaced by new energy cars so far, CO2 emission reduction in China will will be reduced by 33.08 M tons.

(https://www.itdp.org/2018/09/11/electric-buses-china/)

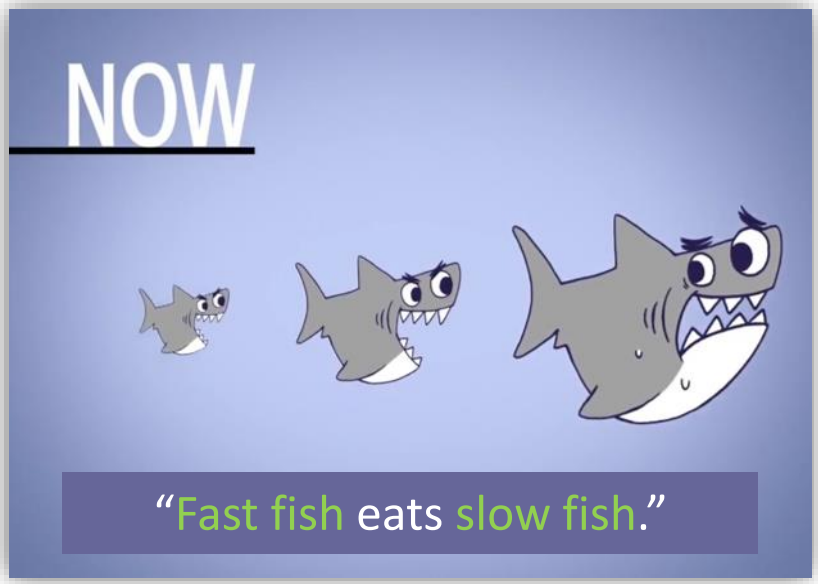
9. Eased Regulation for New Biz in China, What about Korea?

- One unicorn company is created every 3.5 days in China, the cradle of unicorn companies.
- There are 251 unicorn companies in China.
  (As of April, 2021)
- Baidu, Alibaba, Xiaomi, Tencent, etc. have heavily invested in promising unicorns, which is creating a virtuous cycle structure that unicorns foster other unicorns.
- The principle of 'first permit and then supplement' is being applied.
- China State Council's "Green Vehicle Industry Development Plan" (14th Five-Year Plan, 2021-2025) : Plan to make electric vehicles 20% of all vehicles sold in 2025, and aim to sell 6 million electric vehicles in 2025...

- "More than 800 of the 1,500 corporate laws proposed by the 20th National Assembly are regulatory " (Park Yong-man, Chairman of Korea Chamber of Commerce and Industry)
- The international certification criteria for EV battery pack drop test is 1.2m to 2m, while Korea is 4.9m which is extremely much higher.
- Leading to the 'increased costs and weakened international competitiveness'
  (Further Restriction by 'KS R 1204' Standard)
- Due to the regulatory provisions of "more than 2,500 cars or more than 500 cars of the same type per year," the addition of only one battery pack confronts the challenge of re-certification.

10. New Era of Fast Fish eats Slow Fish

- "In the new world, it is not the big fish which eats the small fish, it's the fast fish which eats the slow fish." - Klaus Schwab



- EDISON MOTORS is the 'Fast Fish' who can overtake Tesla.
- Has developed eco-friendly CNG and electric buses from 1998 (Sold electric buses from 2009, first time in the world)
- Sandy Munro, a car tear-down expert, says "Tesla is ahead of their competitors by 10 years with casing and housing, 5 years with electric motor and 8 years with SW." The know-how is in "the vertical integration of technology."

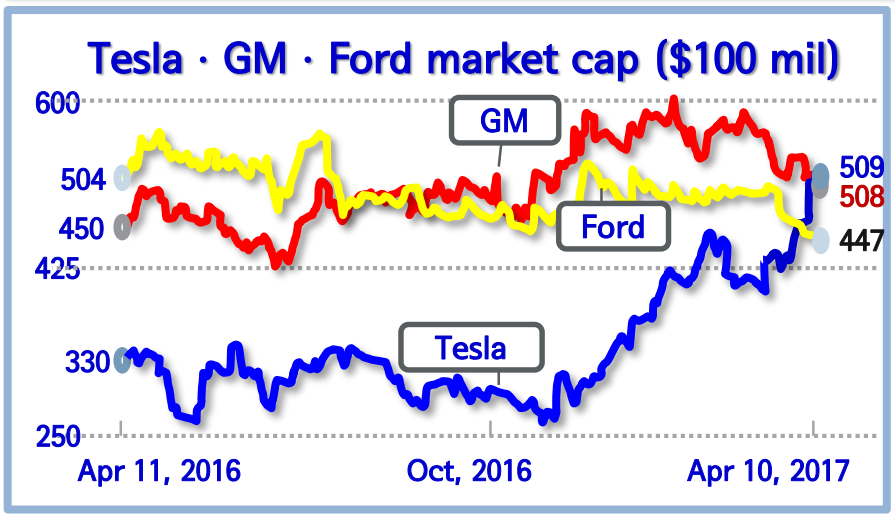
(Source: Torn down Tesla, Chosun daily on Sep 14, 2020)

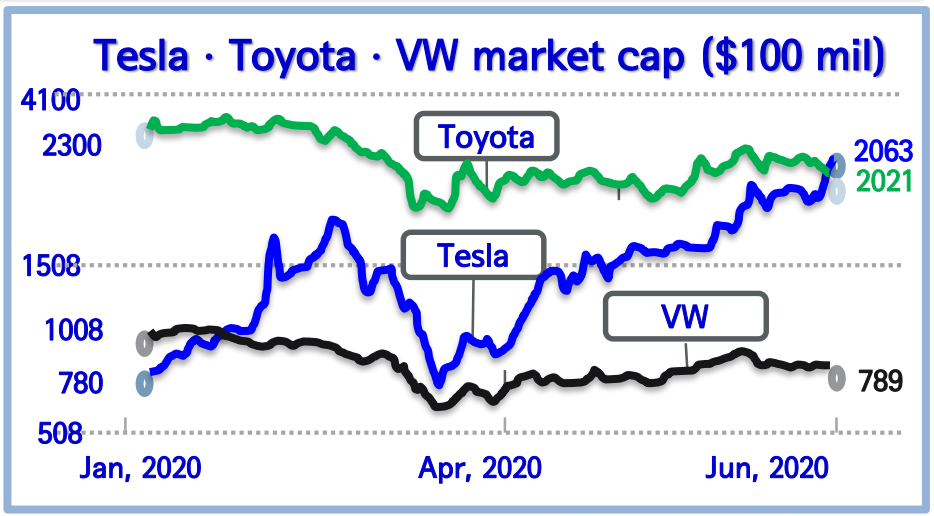
11. "Creative People Make Great Products" – Google

➢ "Creative people make great products" – Google

⇨ Because they are not moving through a maze, they are just jumping over it.

- ➢ Tesla($50.9 billion) which sold 76,000 units in 2017 overtook GM($50.8 billion) which sold 10 million units
- ➢ Beyond Toyota in June 2020, Tesla's U$406.8 market cap doubled the 2nd ranked Toyota's in Aug 2020.

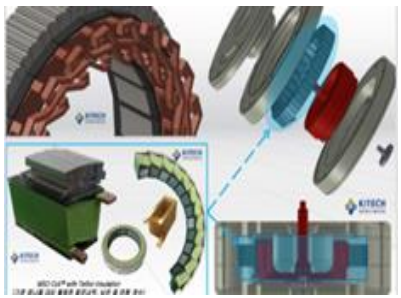




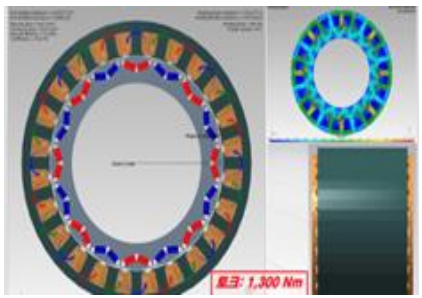
12. Edison Motors' Competitiveness : 3 Core Technologies

Reliable Electric Bus: developed 3 main technologies (Motor + Controller + Battery)

1. Drive Motor Solution(with KITECH)



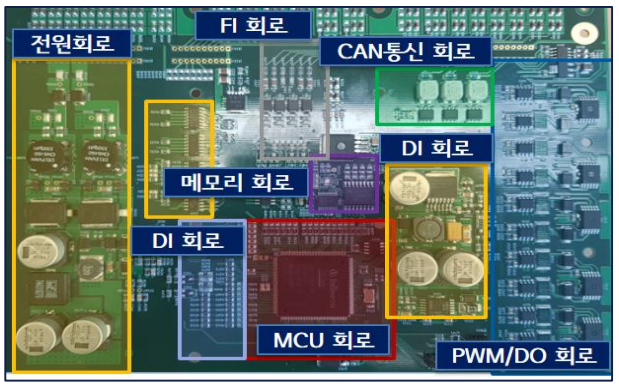
MSO Coil Motor



160kW Torque 1,300Nm

2. Electronic Control Technology

(Next-generation Integrated Vehicle Controller)



3. Smart BMS based Battery Pack

- MSO Coil Motor, which is being co-developed with KITECH, can produce twice as much torque as its equivalent. It will be competitive in the global market.
- The 3rd generation BMS is a smart battery management system that maintains Smart Balancing through active battery monitoring, status evaluation and smart management to dramatically improve battery performance and battery life.

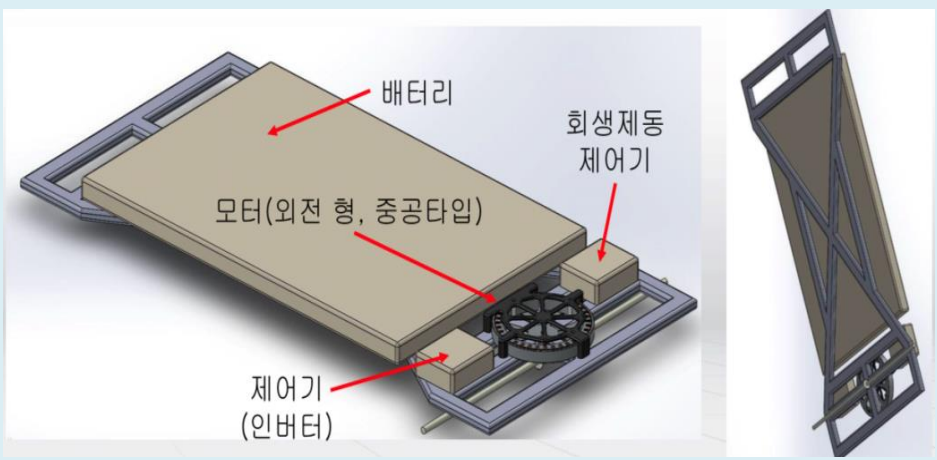
12-1-1. Core Technologies: MSO Coil Motor

MSO Coil Motor Development

R&D Capability

- Leveraging KITECH's R&D researchers and state-of-the-art equipment
- Excellent technical development engineers (hardware, software)
- Edison Motors' advanced technical equipment and facilities
- 130kW and 160kW motors (cylindrical and disk type) development

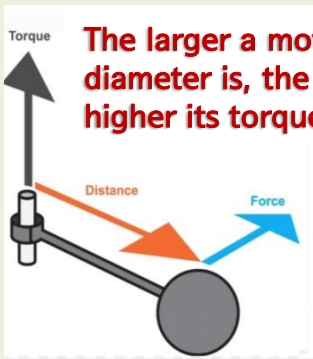
Advantages of Disk Type Motors



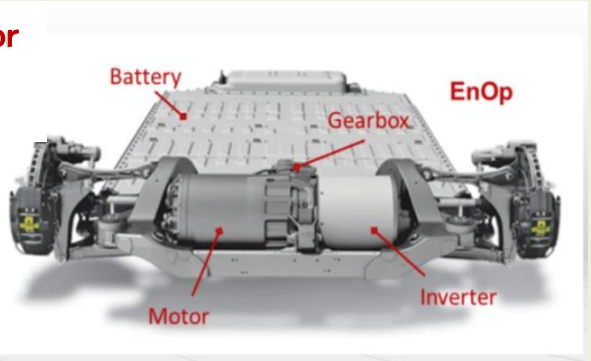
- Disk Type Motor is flexible to larger diameter, appropriate for low speed & high load cars and superior in its package.
- It is easy to reduce both motor material cost (motor material) and powertrain weight.

Efficiency of MSO Coil Motor

Issues in the Existing EV Platforms

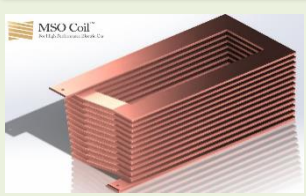


The larger a motor diameter is, the higher its torque.



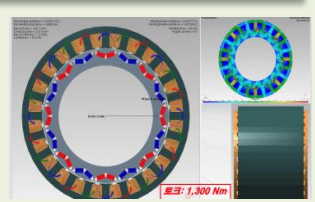
- Difficult to increase motor diameter in EV platforms
- MSO Coil Motor overcomes this design restraint.
- The disk type MSO motor can double the performance of its equivalent.

Efficiency of MSO Coil Motor
(Disk Type: 97.6%, Cylindrical: 95.4%)



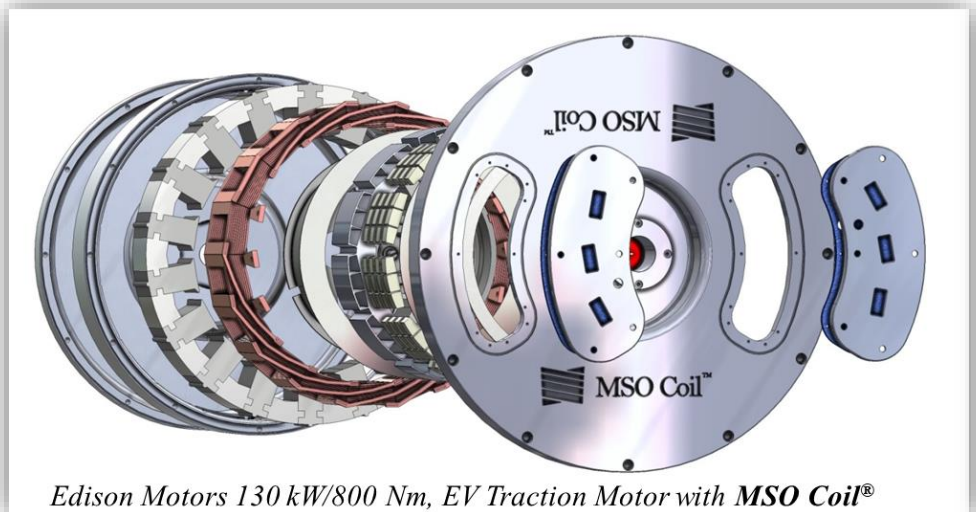
MSO Coil

130kW
Torque 800Nm

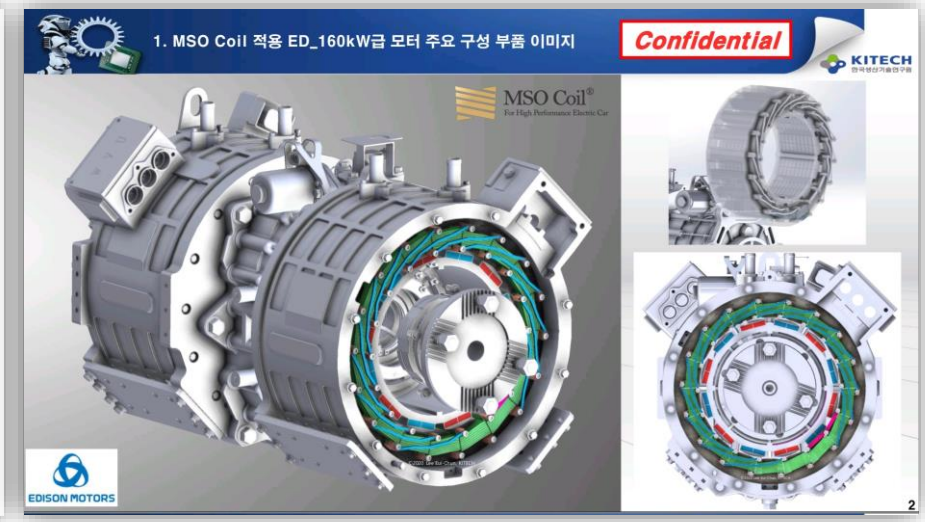


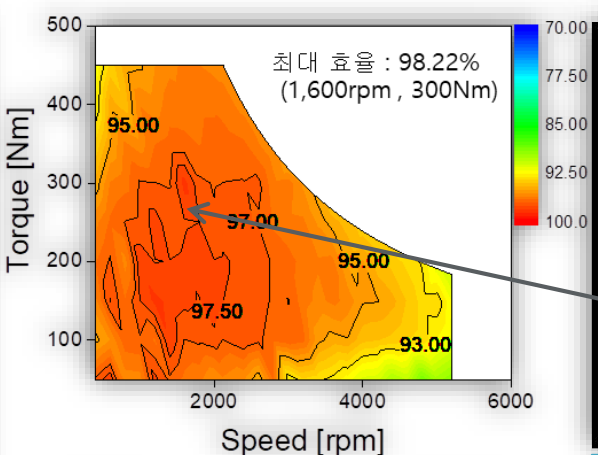
160kW
Torque 1,300Nm

12-1-2. The Max. Efficiency of MSO Coil Motor: 98.22%



*Edison Motors 130 kW/800 Nm, EV Traction Motor with **MSO Coil®***





*Efficiency of **MSO Coil®***

	Element1	Element2
Voltage	600Vrms	600Vrms
Current	500mVrms	500mVrms
U [V]	191.206	191.256
I [A]	188.688	188.326
P [W]	35.280k	17.048k
S [VA]	36.078k	36.019k
Q [var]	7.547k	31.728k
λ [ ]	0.97788	0.47332
φ [°]	G 12.074	G 61.750
fU [Hz]	160.86	160.98
fI [Hz]	160.91	160.91

****** Efficiency ******

η1	92.566 [%]	Inverter
η2	98.220 [%]	Motor
η3	90.919 [%]	System
η4	---------- [%]	

Max. Efficiency : 98.22%, [50kW, 300Nm,1600rpm]

12-1-3. MSO Coil Motor 130kW = Benz AMG 6.0L-Class Performance

➢ MSO Coil® for Superior EV

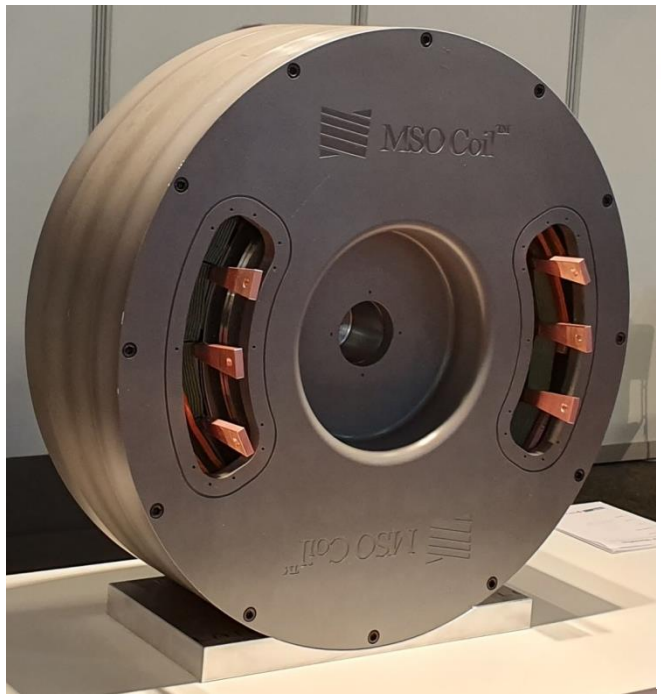
MSO Coil®
For High Performance Electric Car

Company : Mercedes Benz AMG

Model : M275 (6.0L, V12, Twin Turbo, Weight: 270 kg)

Max TQ, Max Speed : 830Nm, 5,000rpm (Water cooling)

Car : S600, S600 Maybach and Maybach Pullman

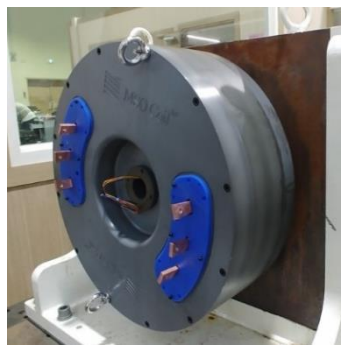


Max TQ : 800Nm

Max Speed : 5,200rpm

Weight : 96kg

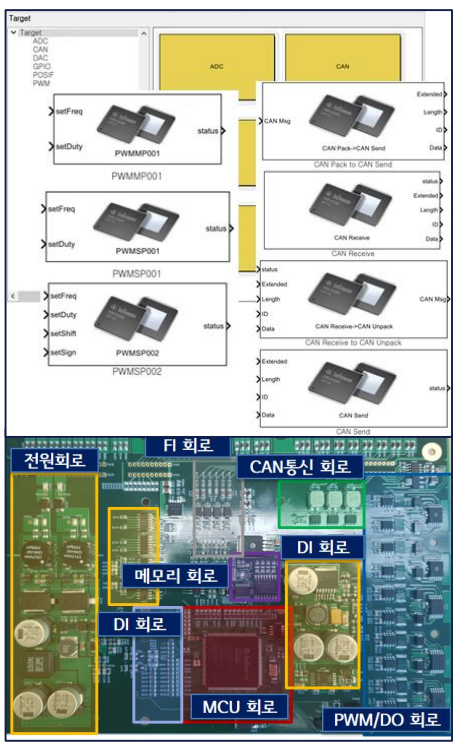
Cooling: Air cooling

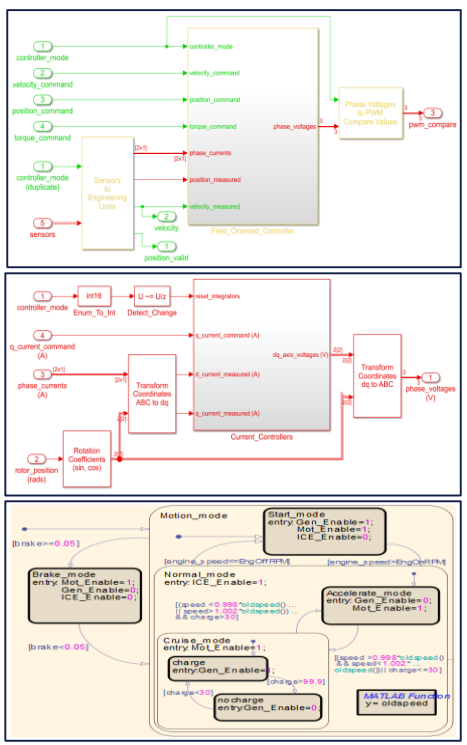


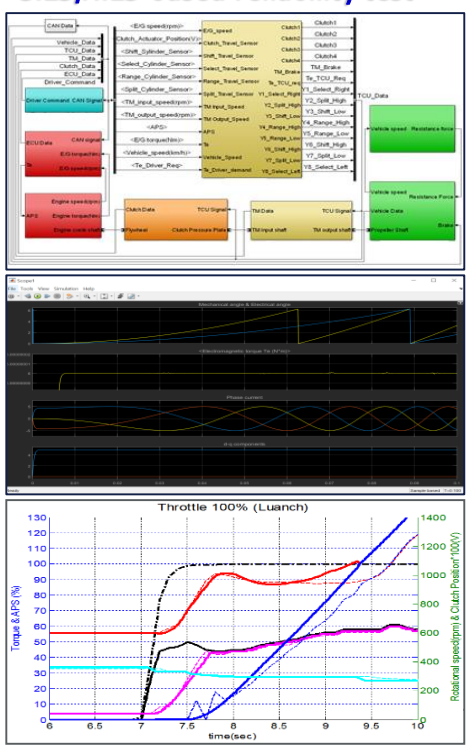
12-2. Core Technologies: Integrated Vehicle Unit (IVU)

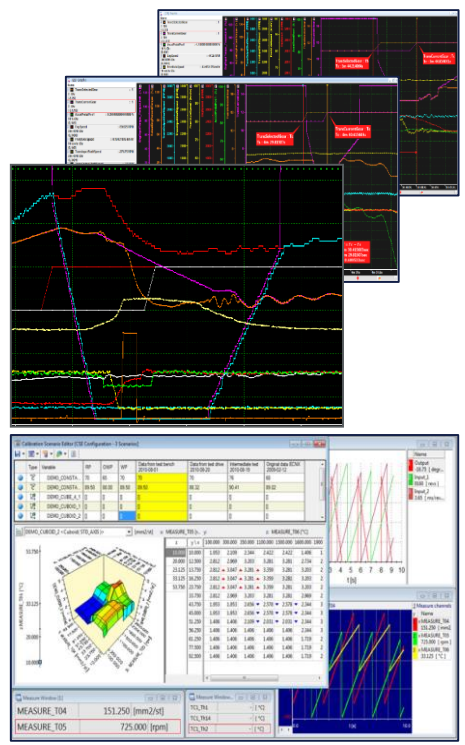
- Research and develop an integrated control SW that incorporates drive mode, drive system control, trouble shooting, safety function, etc.
- Model based design and common IVU(Integrated VCU) platform to shorten the development time and leverage software reliability

Common IVU S/W and H/W Development Platform	Model Based SW Design Technology	SILS/HILS based V&V Technology	Calibration for Optimum Control
▪ Target Blockset embodied ▪ 32bit MCU based circuit design	▪ Model based SW design ▪ Control logic and algorithm	▪ Vehicle and powertrain modeling technology ▪ SILS/HILS based reliability test	▪ Dynamometer vehicle-based calibration technology ▪ Test & validation



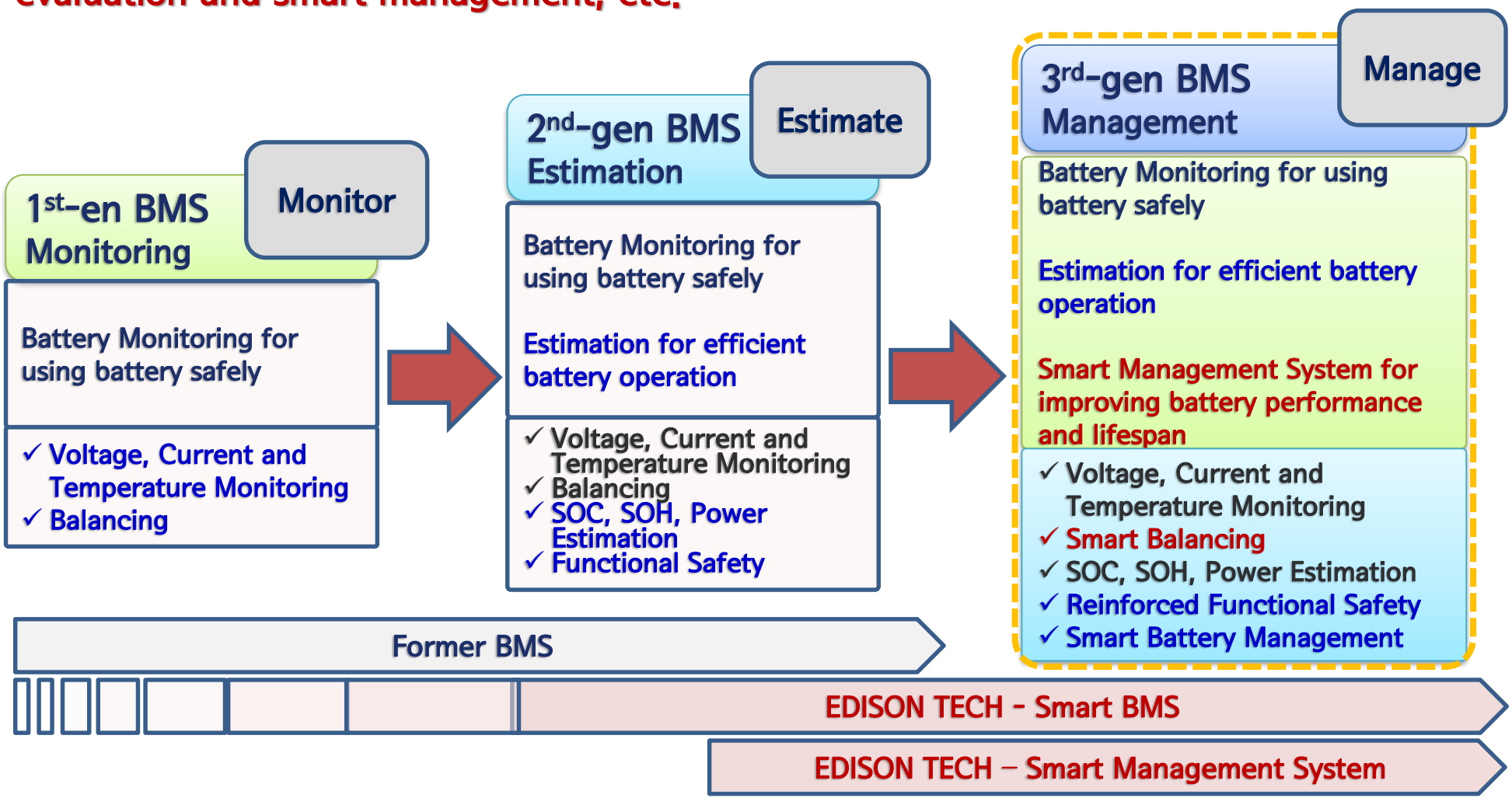






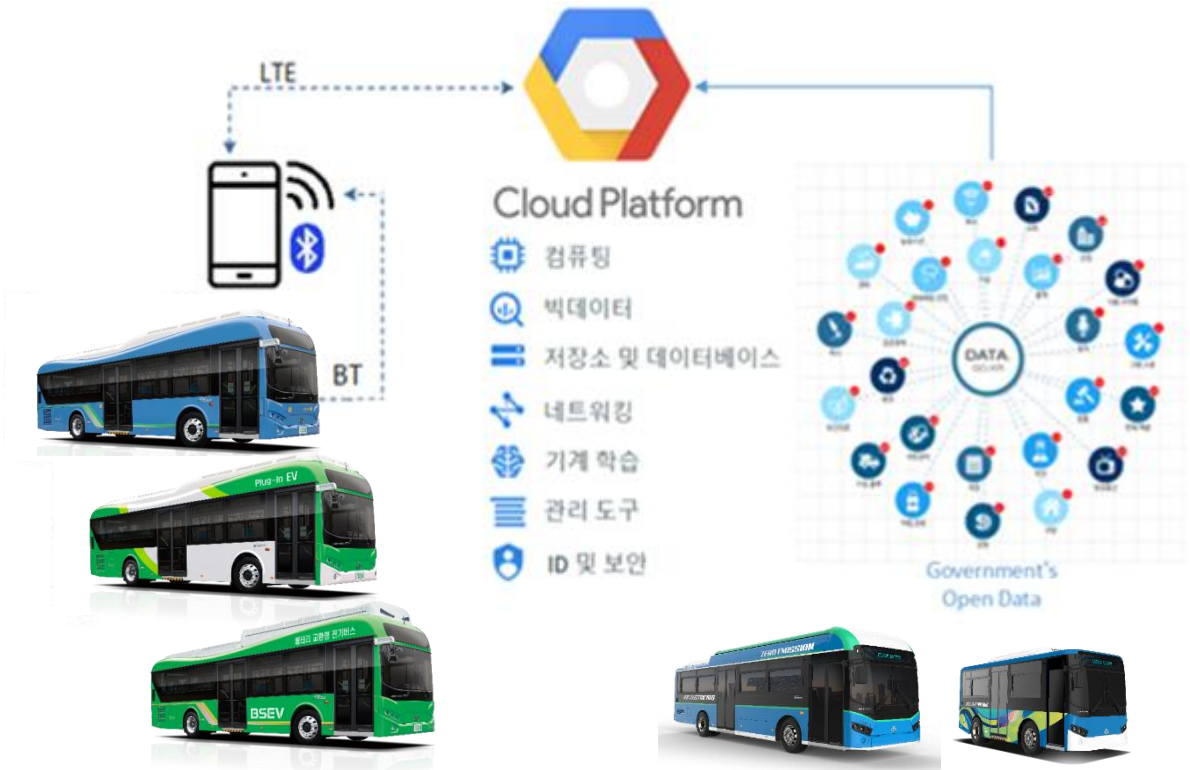
12-3-1. Core Technologies: Next-generation Smart BMS

➢ **Smart BMS (Battery Management System) improves battery performance and lifespan by maintaining Smart Balancing through active battery monitoring, status evaluation and smart management, etc.**



12-3-2. Core Technologies: Next-generation Cloud Platform

- **Communicate with Smart BMS via Bluetooth for continuous enhanced functionality and new service support**
- **Driver's smart phone and Cloud Platform-based Smart Management System interworking**

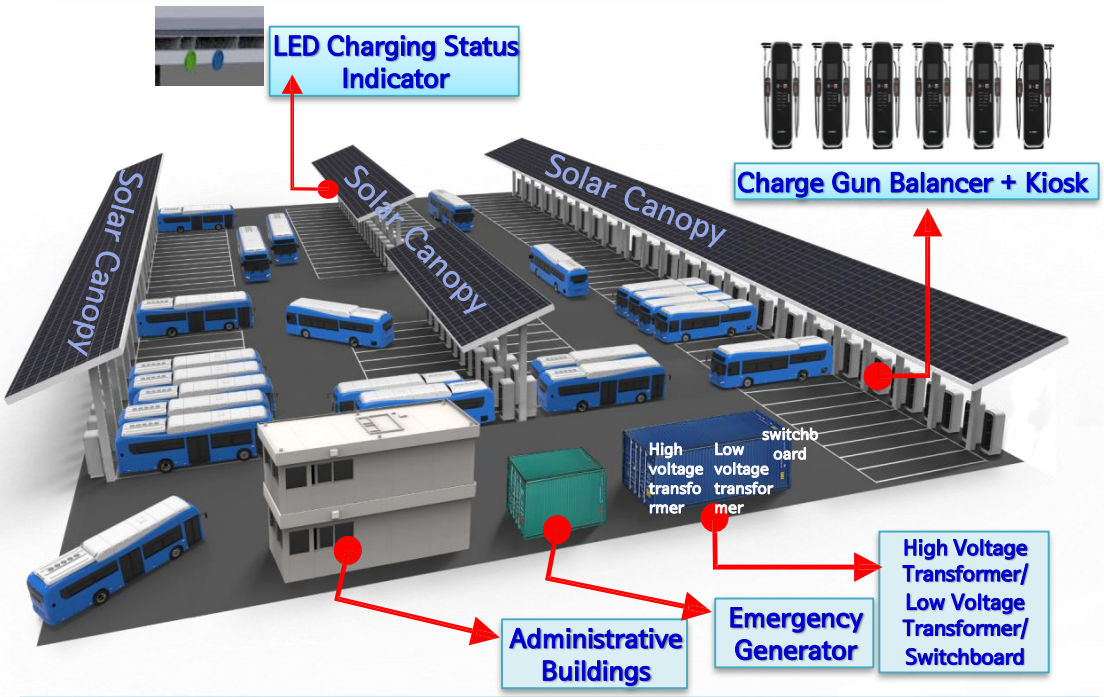


- ✓ Record Battery Use History
- ✓ Vehicle Driving Pattern Analysis
- ✓ Battery Status Analysis
- ✓ Smart SOC, SOH Algorithm
- ✓ Adaptive DOD Control
- ✓ Failure Detect and Remote Repair
- ✓ Remote Update / Check
- ✓ User Check of Battery Status
- ✓ Interlock with Electric Bus Driving Characteristics
- ✓ Optimal Energy Control for Returning to the Garage

- **App update available with Smart Phone enables continuous enhancement of functions and support for new services even after shipment via OTA.**

13. Installation Cost of Centralized Charging System

Aerial View of Centralized Charging System



- Number of simultaneous charges : 36 units of 75kW, 18 units of 150kW, 9 units of 300kW
- Help to receive approx. U$ 495 K in subsidies for installation of solar power facility and charger
- Chargeable unit in case of 2 times continuous charge during the night : 18 ~ 72 units available
- 2,850kW Electricity : U$ 65 K (underground wire), U$ 30 K(overhead wire)

❖ This estimate is based on the installation of charging systems for 24~36 electric buses (varies depending on the condition, tax separate)

Introduction Volume Cost

Division	Content	Spec.	Quantity
Electric Bus Bulk Charging Infrastructure	Dispenser	2ch(Combo 2)	24~36
	Power Bank	900kW	2~3
	Switchgear	Switchgear(950kW)	3
Additional Features	Solar Canopy	370Wp x 450(165kW)	1

Actual Results and Build Costs

Division	Content	Qty.	Govt. Subsidy	Construction cost
Electric Bus Charging System	150kW 2Port Kiosk	18	U$ 260 K~ U$ 390 K	U$ 700 K~ U$ 1M
	900kW Power Bank	3		
	2,850kW Switchgear	1		
	Charger electricity / communication / installation work	1		
	Operation Management Program	1		
Division	**Content**	**Qty.**	**Govt. Subsidy**	**Construction cost**
Solar & Emergency Power System	Solar structures, electricity, civil work	1	U$ 50 K~ U$ 105 K	U$ 143 K~ U$ 287 K
	165kW Solar equipment	1		
	500kW Emergency generator and control system	1		
Total Construction Cost			U$ 315 K~ U$ 500 K	U$ 850 K~ U$ 1.3 M

14. Edison Motors' Competitiveness: Carbon Fiber Bus Body

Autoclave

- 10 to 15% energy saving for 11m electric bus
- Excellent corrosion resistant and non-flammability
- CFRP strength to specific gravity
  : 9.6 times stronger than steel and 4.9 times than aluminum

CFRP body

1 to 1.5 ton lighter than steel body

15. EDISON MOTORS' Electric Vehicle Line-up (Bus & Truck)

Electric Bus

NEW e-FIBIRD 110
Low-floor EV / Plug-in / Main Model

e-FIBIRD BSEV
Low-floor EV / Battery Replacement Type

SMART 110H
High-floor EV / Plug-in

SMART 093
Large EV

SMART 087
Medium EV

SMART 077 Under Development
Medium EV
(Estimated Launch Time: 1st half, 2022)

CNG Bus and Electric Truck

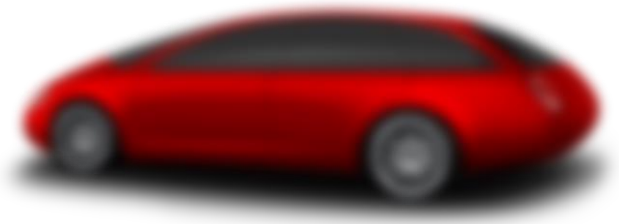
FIBIRD 110
Low-floor CNG / Main Model

SMART 110HG
High-floor CNG

SMART T1 Electric truck

16. EDISON MOTORS' Sedan & SUV Line-up (Under Development)

Electric Sedan



SMART S Super Class EVE
(Estimated Launch Time: 2nd half, 2022)

SMART E Medium class EV
(Estimated Launch Time: 1st half, 2023)

SMART A Small Class EV
(Estimated Launch Time: 1st half, 2022)

SMART MINI A Small Class EV
(Estimated Launch Time: 1st half, 2022)

SMART EV Z Small Class EV
(On sale at Semisysco & evmall4u)

Electric SUV

SMART XS Electric SUV
(Estimated Launch Time: 2nd half, 2022)

SMART XE Electric SUV
(Estimated Launch Time: 2nd half, 2022)

SMART XA Electric SUV
(Estimated Launch Time: 1st half, 2022)

17. EDISON MOTORS' PAV and Drone (Under Development)

PAV

 PAV(Personal Air Vehicle) (2-4 seats, Estimated Launch Time: 2nd half 2022)	 VTOL (2-4 seats, Estimated Launch Time: 2nd half 2023)	 VTOL (4 seats, Estimated Launch Time: 1st half 2025)
 Electric Flying Vehicle (4 seats, Estimated Launch Time: 2nd half 2024)	 Electric Flying Vehicle (5 seats, Estimated Launch Time: 2nd half 2025)	 Electric Jet Flying Vehicle (5 seats, Estimated Launch Time: 1st half 2025)

DRONE

 Agricultural Drone (Estimated Launch Time: 2nd half 2021)	 Package Delivery Drone (Estimated Launch Time: 1st half 2022)	 Container Delivery Drone (Estimated Launch Time: 2nd half 2023)

※ Above images are for reference only and subject to change during development work.

18. EDISON MOTORS' Electric Yacht & Boat (Under Development)

Electric Yacht

 18ft Electric Yacht (Estimated Launch Time: 1st half 2022)	 33ft Electric Yacht (Estimated Launch Time: 2nd half 2021)	 48ft Electric Hybrid Yacht (Estimated Launch Time: 2nd half 2021)
 Seabubbles Transport System (Estimated Launch Time: 2nd half 2022)	 62ft Electric Yacht (Estimated Launch Time: 2nd half 2023)	 165ft Electric Yacht (Estimated Launch Time: 1st half 2025)

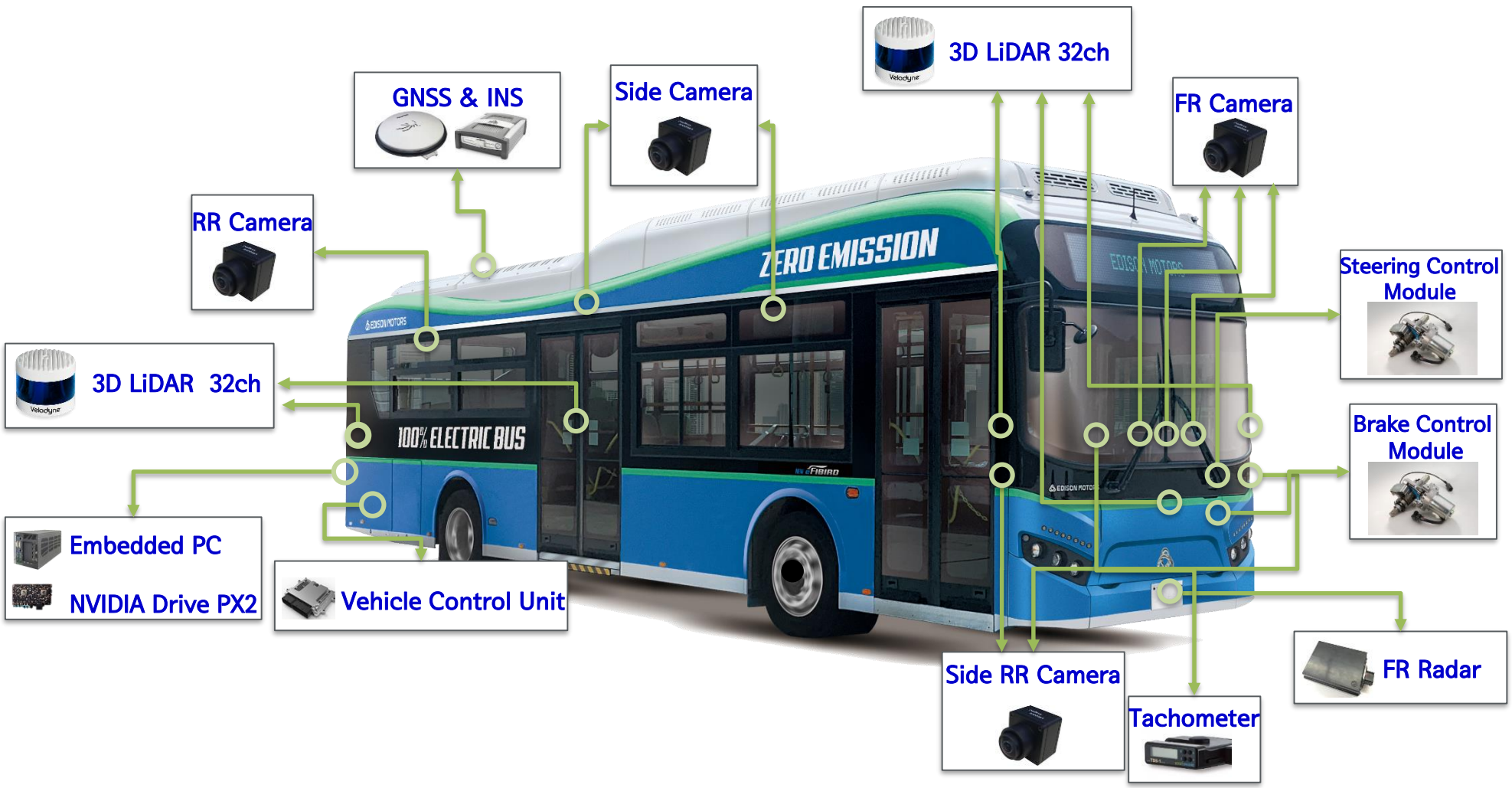
Electric Boat

 18ft Electric Fishing Boat (Estimated Launch Time: 2nd half 2021)	 62ft Electric Fishing Boat (Estimated Launch Time: 1st half 2023)	 Hydrofoil Passenger Vehicle Autonomous(Estimated Launch Time: 2nd half 2025)

※ Above images are for reference only and subject to change during development work.

19. EDISON MOTORS' Autonomous e-Bus (60 to 100 km/h)

Autonomous System Configuration(Estimated Launch Time: November 2021)

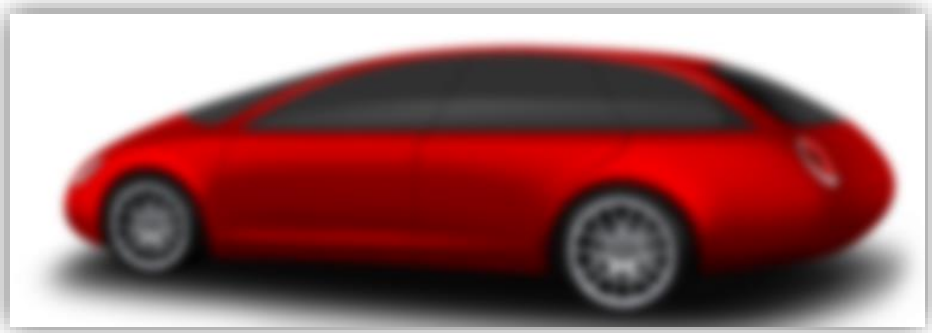


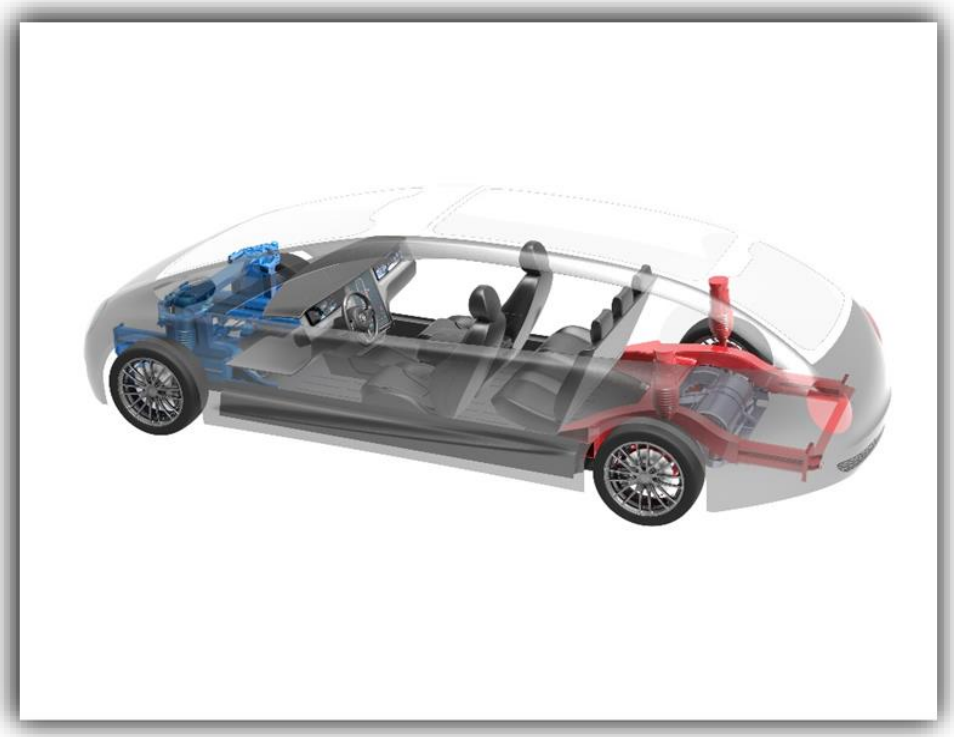
20. Mid & Long-Term Mobility Service Vision

- Aim an e-commerce and sharing biz platformer in the EV industry to become like "Amazon', 'Alibaba', 'Apple' or 'Uber'
- Benchmark the strategies of Amazon, Apple, Google and BTS (K-pop Group), which are leaders of each area, to grow to the world best EV platformer

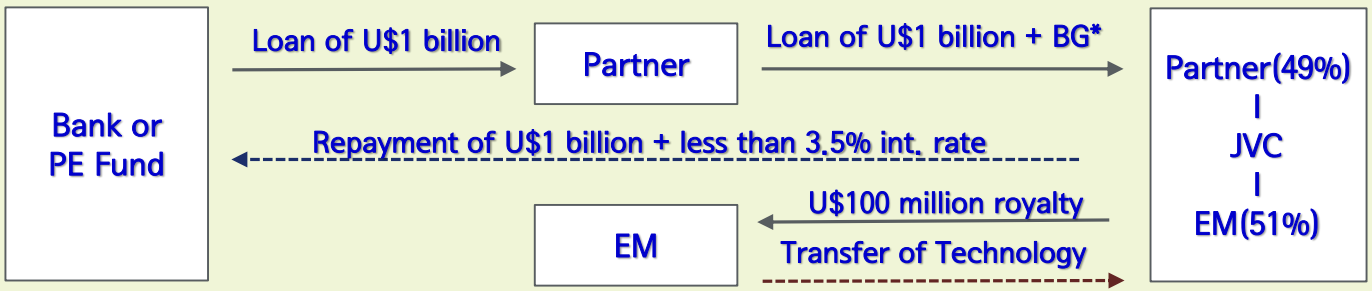
21. EDISON MOTORS' Future Vision

- EDISONMOTORS is a hidden champion in the EV industry, with its EV manufacturing capability and global competitiveness.
- EDISONMOTORS plans to establish 20 JVCs around the globe, receiving each USD100 mil. royalty per JVC.
- EDISON MOTORS' target is to produce and sell 10 new EVs by 2021, 20 new EVs by 2025 and 30 new EVs by 2030, aiming to lead the era of autonomous vehicle technology which will be in the market within 5 years.





22. Scheme of Investment and JVC Advantage

Scheme	Biz Model	Remarks
Joint Venture		❖ Partners should be responsible to raise U$ 1 B loan under a bank guarantee of their own. ❖ Such loans will be secured by JVC stocks and facilities, and JVC is responsible to repay the loan.

Partners

- With a full access to EDISONMOTORS' technology, Partners shall be able to jump up to one of leading EV companies that outdoes global OEMs.
- Win-win strategy through technical cooperation for MSO Coil Motor, Smart BMS based battery pack, composite materials, etc.

EDISONMOTORS

- EDISONMOTORS plans to increase the company value by 20 to 50 times' growth within five years.
- Win-win strategy through financing and technical cooperation to compete with global automakers.

23. U$ 1 B Loan Investment Plan

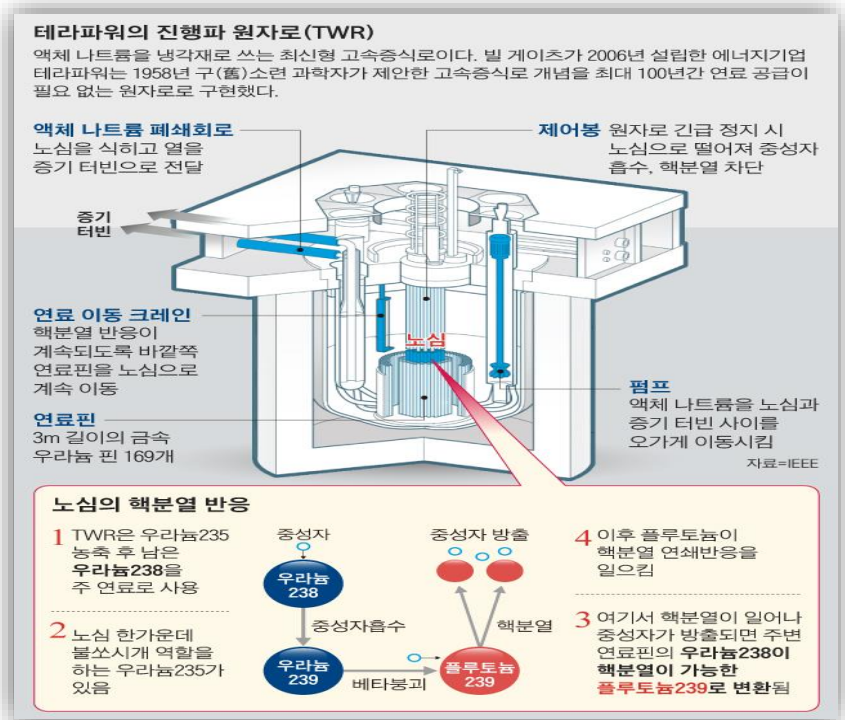
U$ 100 M	Factory and Bus production line
U$ 100 M	Truck production line
U$ 300 M	Passenger car production line
U$ 200 M	SUV production line
U$ 200 M	Purchase of components and materials
U$ 100 M	JV operations and sales & marketing

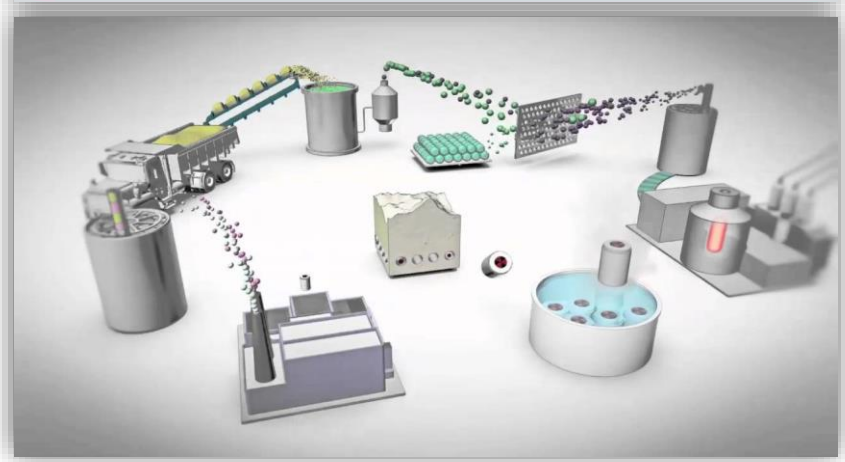
- In China, it costs U$ 1 B to establish an automobile assembly plant with 300,000 p.a. production capacity. Tesla spent U$ 1 B to build one in Shanghai.
- Reduce costs by exchanging competitive parts and components among JVCs
- Contribute to job creation through semi-automatic manufacturing process, rather than full automatic
- Expand production facility with the target to produce 500,000 cars p.a. within 10 years, through additional investment and sales profit

- U$ 100 M as technology royalty:
  - It costs approximately U$ 50 M to develop one car model, when design work is outsourced.
  - Immediate transfer of manufacturing technology for 10 models EDISONMOTORS has developed, which are worth approx. U$ 500 M.
  - Daimler and BMW spend more than U$ 300 M to develop one model.
  - Once JVCs are established, agreements should be signed with local governments to give priority to JVC produced cars in government purchase programs.

24. TWR Rule out Disaster and Fuels up to Nuclear Waste

- TWR(Travelling Wave Reactor) is a fast reactor that can use uranium 235 and uranium 238, which is extractable from reactor waste.
- It was proposed in 1958 by a Soviet scientist, and Bill Gates simulated the concept by super computer at TerraPower company, which he formed in 2006.
- It adopts a liquid sodium-cooling in closed circuit, which can basically rule out the possibility of such nuclear disaster as Chernobyl or Fukushima.
- 5 to 6mm fuel pin (1cm for Korean reactor) is thin enough for easier cooling. If a reactor temperature abnormally goes up, the fuel pin expands, and it lowers its energy density. The possibility of its collision with natural neutron is then significantly reduced to secure reactor safety on its own. It is a new technology.
- CNNP, which is the subsidiary of CNNC (China National Nuclear Corp.), signed a MOU with TerraPower on Sept., 2015 to jointly develop TWR and was working on the project. (currently stopped due to US-China trade war)





https://youtu.be/johZ5Ay6RRE

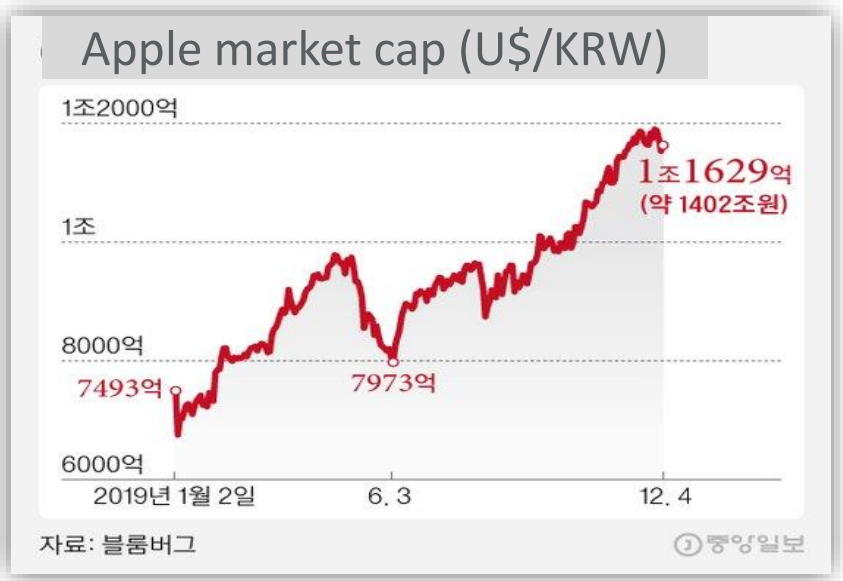
25. Drastic Changes Needed in Financial Policy and System

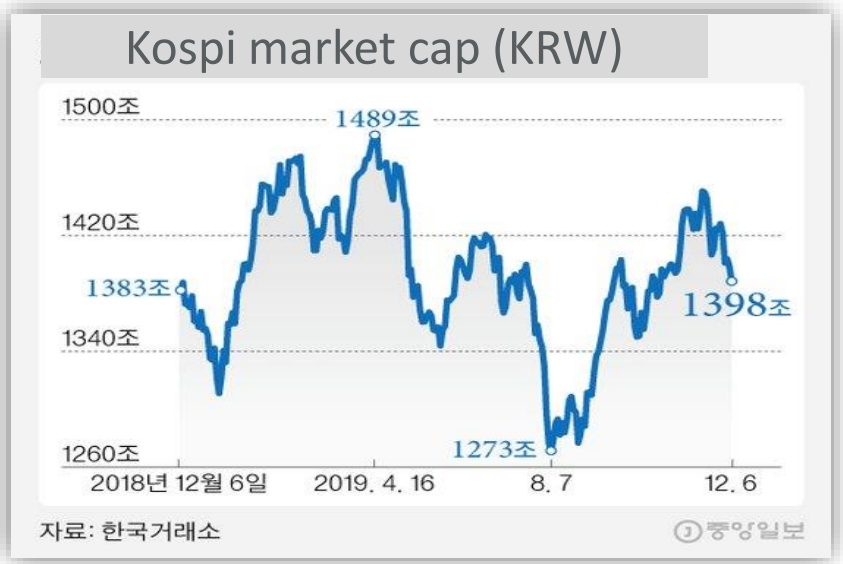
- Samsung Electronics' operating profit in the 2nd quarter, 2017 was KRW 14 tril, which was similar to that of FANG, 4 US platform companies, while its market value was even less than 20% of FANG.
- Edison is benchmarking the strategies of leading e-commerce platformer Amazon, smart phone platformer Apple and search engine platformer Google to grow itself to the world's top EV platformer.
- Developed countries' financial system should be employed through a 'drastic financial policy reformation' so that companies could borrow money from banks even only with their technology and credit without security.
- Global investments and M&A techniques of JP Morgan, Goldman Sachs, etc. should be benchmarked and learned to open the era of US$50,000 per capita income in 2030.

@ the 2nd quarter , 2017, Samsung Electronics' operating profit & market value VS FANG, the 4 platformers'

26. Apple Market Value Exceeded Kospi Total

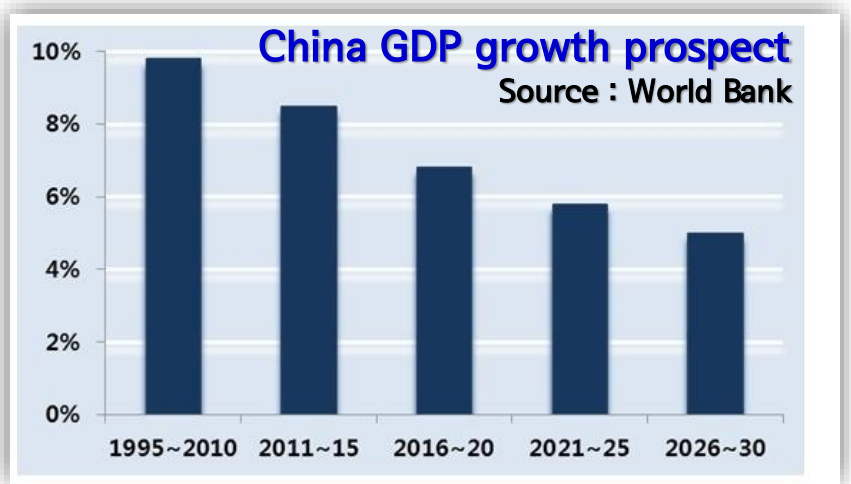
- According to Bloomberg and Korea Stock Exchange, Apple's market value recorded U$1.163 tril.(KRW1,402 tril.), which exceeded the entire Kospi value, KRW1,384 tril. for the first time, as of Dec 4, 2019.
- Apple performance is flying high, propelled by the over 18% sales increase of Apple Music, Apple Pay, App Store, etc.
- Apple is highly expected to become a platform service provider rather than a smartphone manufacturer.
- Apple market capitalization is about 2,941 trillion won, kospi market capitalization is more than about 2,228 trillion won(2021. 8. 30.)





27. Challenge Advanced Financing & Investment Industry and Combined Industry

- All China did in the past to achieve 7 to 8% high economic growth was to purchase parts from Korea, assemble them in China with cheap labor and export overseas. Now China even needs to make parts locally to maintain such growth rate.
- 'China has to take over the Korean parts industry.' (futurologist Choi Yoon-sik's "2030 Brave New World 2")
- A drastic transformation is needed into the core areas of 4th industrial revolution, which are artificial intelligence, robotics, IoT, unmanned aircraft, automobile, 3D printing and nano technology.
- We must challenge the core competency of the USA, which are financial industry, investment industry and finance combined industry such as lease and mortgage, to get out of our 'systematic hurdles' and grow our economy to a developed country level with per capita GDP of U$ 50,000 by 2030.



28. Why no FANG or BAT in Korea?

- Academic elitism prevails in Korea. Due to our educational system and social prejudice, top 1% talented students mostly pursue either medical or law schools.
- More efforts should be made to create an atmosphere in our society to encourage the top talented students to take careers in the 4th industrial revolution areas, and 'educational policy and system innovation' should be made to make it happen.
- 'Through educational innovation, happy education and school' policy should be implemented. 'The current education system should be improved to foster global competency in human resources', educating and training students to the best in each area.

29. Innovative Training Programs to Foster Creativity

- The purpose of French SW programming school 'Ecole 42' is to train and educate excellent IT human resources, around 1,000 students per year, to resolve manpower shortage in the industry.

- An innovative university, Minerva Schools, which is an online school without campus, started with the intention of 'finding new solutions for broken education system', running classes in a small discussion group. For four years, students go to every corner of Seoul, San Francisco, London, and Taipei to learn from each culture of the country and get ideas.

- The German-style two-way career and education system "Ausbuildung" consists of 30 percent of theoretical education in schools and 70 percent of practical training in job sites.

- It is high time to adopt a system in which high school graduates are also entitled to apply for substitutional service of military in industries for five-year.

30. 10 years' Cost Comparison btw EV and ICE Buses

➢ Fuel cost and maintenance cost comparison

➢ Unit: KRW

Description	Fuel cost/km	Fuel cost			Maintenance cost (incl. charging/maintenance facility cost)			
		250km / day	1 year/ 12 months	10 years	250km/day		1 year/ 12 months	10 years
					Maintenance	Facility		
Low-floor e-bus	110	27,500	10,037,500	100,375,000	5,000	4,000	3,285,000	32,850,000
Low-floor CNG bus	520	130,000	47,450,000	474,500,000	23,000	2,000	9,125,000	91,250,000
Diesel bus	700	175,000	63,875,000	638,750,000	28,000	2,000	10,950,000	109,500,000

➢ Bus purchase price comparison including subsidy

Description	Bus price	Subsidy (based on 2020 standard)		Actual purchase price
		Environment	Low-floor bus	
Low-floor e-bus	375,000,000	100,000,000	90,160,000	184,840,000
Low-floor CNG bus	215,000,000		90,160,000	124,840,000
Diesel bus	120,000,000	—		120,000,000

➢ Total cost for 10 years' operation

Description	Purchase price after subsidy	Fuel cost for 10 years	Maintenance cost for 10 years	Lubricant and filter replacement	Fuel charge labor	Total
Low-floor e-bus	184,840,000	100,375,000	32,850,000	4,500,000	73,000,000	395,565,000
Low-floor CNG bus	124,840,000	474,500,000	91,250,000	45,000,000	265,500,000	1,001,090,000
Diesel bus	120,000,000	638,750,000	109,500,000	45,000,000	215,500,000	1,128,750,000

➢ Seoul city bus company's estimated daily revenue and cost per one bus (based on 30 days per month)

Description	CNG bus (4~8 times/day)	e-bus(4~9 times/day)	Remarks
Revenue	17,550,000	18,500,000	2 hrs per day's charging time (5% more revenue for EV)
Driver labor/admin	8,500,000	8,500,000	Same labor, but better working environment
Fuel cost	3,900,000	825,000	Aprox 80% saving, even incl. electricity cost increase
Maintenance cost	2,150,000	919,500	Daily KRW 50,000 of driver labor for CNG fueling
Net income	3,000,000	8,256,000	Monthly KRW 5,256,000 more revenue vs CNG

❖ The above is an estimation calculated based on the actual data of OO bus company in Bucheon-si, Gyeonggi-do from Dec, 2019 to March, 2020.

❖ CNG bus driver need to spend 2hours per day to fuel CNG bus, and it causes KRW 100,000 loss, driver labor KRW50,000 and no service loss KRW50,000 (one time service revenue).

☛ City bus service savings will be KRW4.5 tril. for Seoul, KRW2.1 tril. For Busan, KRW2.5 tril for Incheon, KRW0.91 tril. For Daegu for 10 years.

31. Savings by Replacing the Entire ICE with EV

➢ Estimated savings for 10 years (assumed to replace all registered ICE vehicles with EVs)

Electric vehicles	Number of vehicles	10-year savings
11m Large electric bus	68,881	Approximately 38 trillion won
9m Medium Electric Bus	34,268	Approximately 14.5 trillion won
7m Medium Electric Bus	22,846	Approximately 7.5 trillion won
SMART S (EV)	3,224,188	Approximately 413 trillion won
SMART E (EV)	10,030,944	Approximately 622 trillion won
SMART A (EV)	1,167,965	Approximately 78 trillion won
SMART MINI (EV)	1,814,048	Approximately 85 trillion won
SMART X (EV)	1,354,906	Approximately 69 trillion won
SMART RV (EV)	433,802	Approximately 23 trillion won
SMART T (EV)	3,535,633	Approximately 236 trillion won
Total	21,687,481	1,586 trillion won (USD 1,379bn)

☞ The above is estimated by EDISONMOTORS' R&D based on OO company's actual data and the Ministry of Land, Infrastructure, and Transport's automobile registration status, as of Dec., 2017.)

32. CEO Resume

Young Kwon Kang

2017.09. ~ present	Joint CEO of EDISON TECH (Joint CEO JM Park developed SMART BMS and battery pack.)
2017.01. ~ present	CEOs of EDISONMOTORS (EV), iEDISON (automobile import/export, sales & sharing biz), Siberia Resource Development (obtained Baykal lake mineral water permit), SOLAR ENERGY (ESS&CPV solar energy), Hankyung TEC (rare earth material)
1998.01. ~ present	CEO and majority shareholder of ENERGY SOLUTIONS (ex-CAA, Creative Artist Association)
2003.10. ~ 2018.	Majority shareholder of EST and ES Cheongwon (new renewable energy, industrial/medical waste treatment)
1996.01.~1998.01.	SBS PD/Current Affairs Dept., Deputy Director/Outsourcing & Planning manager, Directed 'happiness search', 'unanswered questions', etc.
1985.04.~1991.05.	KBS PD/Planning & Production Dept. Directed 'Entertainment Relay', 'Viva Youth', 'Huddles bigger than huddles', etc.

MA, Graduate School of Journalism & Mass Communication, Yonsei Univ. (1994)
BA, Dept. of Sociology, Yonsei Univ. (1985)

- Directed the SBS TV program "Unanswered questions" with the idea that 'the topics in most public interest would attract more audience', which recorded 2 times' higher viewer than average
- Won SBS best picture award in July, 1994 with "Unanswered questions – Disappeared, missing wife" (Achieved highest viewers at 43.8%. The weekly highest viewer was then around 27% across all 3 broadcasting companies.). Planned on a start-up, being confident that the viewer attracting know-how being connected to a business would bring success
- Wrestling btw SBS PD and my own biz, resigned SBS in June, 1997 to establish CAA, dreaming Michael Ovitz type of business, as it was my one and only dream. Managed ES Chengwon (EBITA MARGIN 50% company) which took over industrial waste incineration and landfill biz in 2005 and medical waste treatment biz later.
- 'Wanted to contribute to struggling Korean economy with an EV company that exceeds Tesla' and decided to take over the electric vehicle manufacturer, which was previously run by H company and sold to a Chinese firm, being affected by Tony Seba's "Energy Revolution 2030" and a Korean futurologist Yoon Sik Choi's "Bold future 2030".
- Developed the 3rd generation Smart BMS and battery pack, 130kW 160kW MSO Coil MOTOR jointly with KITECH, world best class low-floor electric bus, electric truck, etc. to enhance Edison's competitiveness, based on PD experience and capability
- Patented future-oriented sedan and SUV design that will lead autonomous vehicle era
- Awarded '2020 top Korean brand', 'Korean future leader', '2019 good workplace', '2018 Korean top leaders', 'Korean industry prize', 'Korean EV industry prize', '2017 Innovative Korean & power Korea', '1996 SBS best film' (SBS anniversary special 4-episode 'Korean and Japanese'), etc.

33. Michael Ovitz CAA(Creative Artist Agency)

Michael Ovitz

- Michael Ovitz leads CAA, the world's largest show business agency.
- CAA is a management company that controls the Hollywood entertainment industry, working as the manager for over 200 top movie stars, musicians, filmmakers and screenwriters that includes Steven Spielberg, Julia Roberts, Arnold Schwarzenegger, Tom Hanks, Tom Cruise, Sylvester Stallone and Demi Moore, etc.
- He scouted Steven Spielberg recognizing his gift as a filmmaker and arranged a team with talented writers, directors, a special effect company(PICSA), etc. to produce movies like Jurassic Park, etc.
- It was Ovitz's mediation that enabled Sony, the Japanese consumer electronics global giant, to acquire Colombia Pictures and TriStar Pictures for U$ 4.8 B in 1989, and another Japanese consumer electronics company Matsushita to acquire MCA in 1991.
- Renowned Hollywood actors, actresses, dramatist, directors, producers and celebrities join CAA and seek for their casting negotiations, fund raising, image management, advertisement, etc.
- He found CAA (Creative Artist Agency) with 3 colleagues at the age of 29 in 1975.
- He was a part time tour guide at nearby Universal Studios, while studying at the University of California in 1967. This experience later served as a momentum for him to plan on an entertainment business.

EDISON MOTORS CO., LTD.

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