

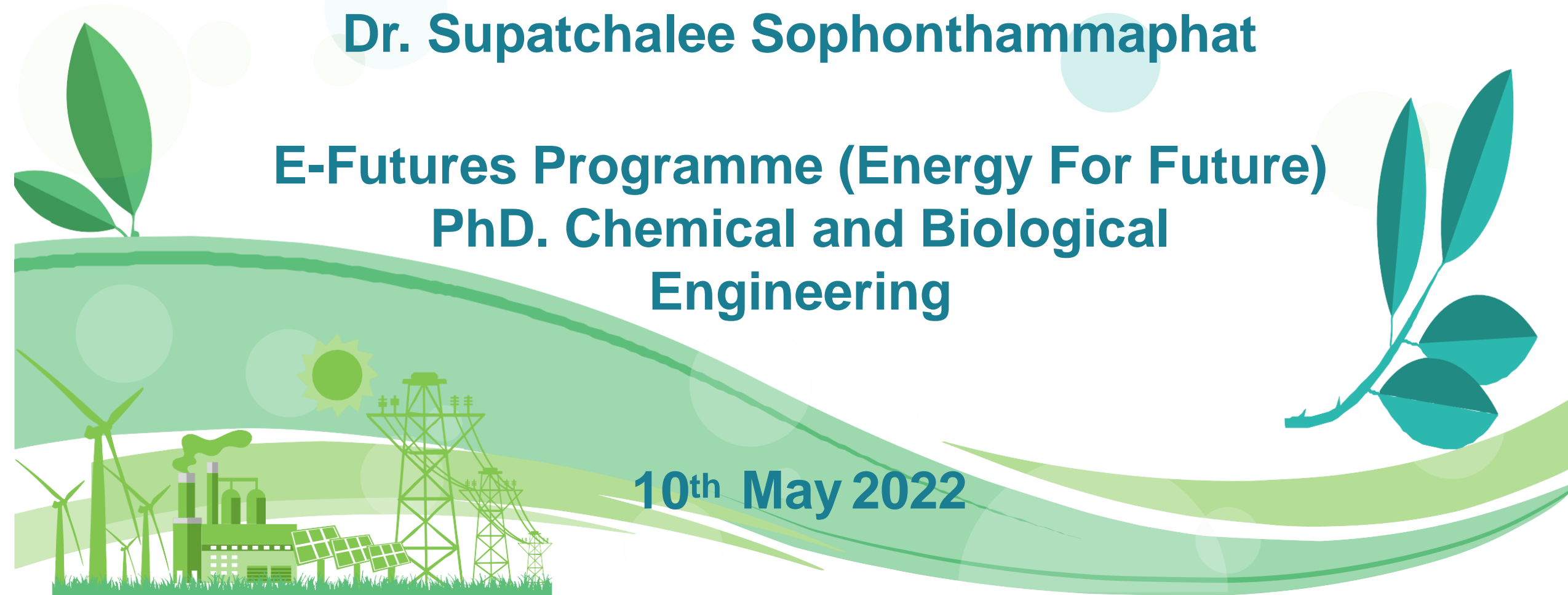


Bioenergy for Energy Access, Security and Industrialization

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**E-Futures Programme (Energy For Future)
PhD. Chemical and Biological
Engineering**

10th May 2022





COP26



Thailand NDC will be 40% by 2030
Carbon neutrality by 2050
Net GHG emissions by 2065



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Main Routes to decarbonisation



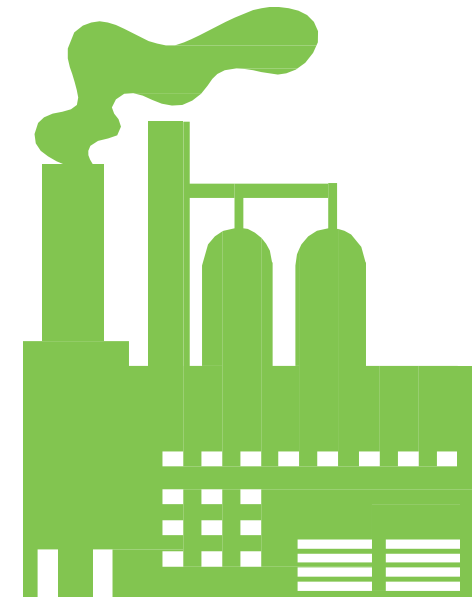
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1.Reducing demand for carbon intensive production & Service

2.Potential CO₂ reduction from circular economy and modal shifts + logistic efficiency

3.Improving energy efficiency

4.Deploying decarbonisation technology across all sectors (Electricity, biomass, carbon capture, H2 fuel cell)





Now : **AEDP -2018** (Draft) National Energy Plan

Glasgow 2021 Agreement

Carbon Neutrality : 2065-2070

Electricity:

- Increasing RE and Clean Energy
- Enhancing EV car
- Developing Grid Modernization (Micro-grid distribution)
- Law& Regulation amendment

Natural Gas

- Free & Fair Trade for supply side (Energy Security)
- balancing national LNG supply side & LNG impority

RE & EE

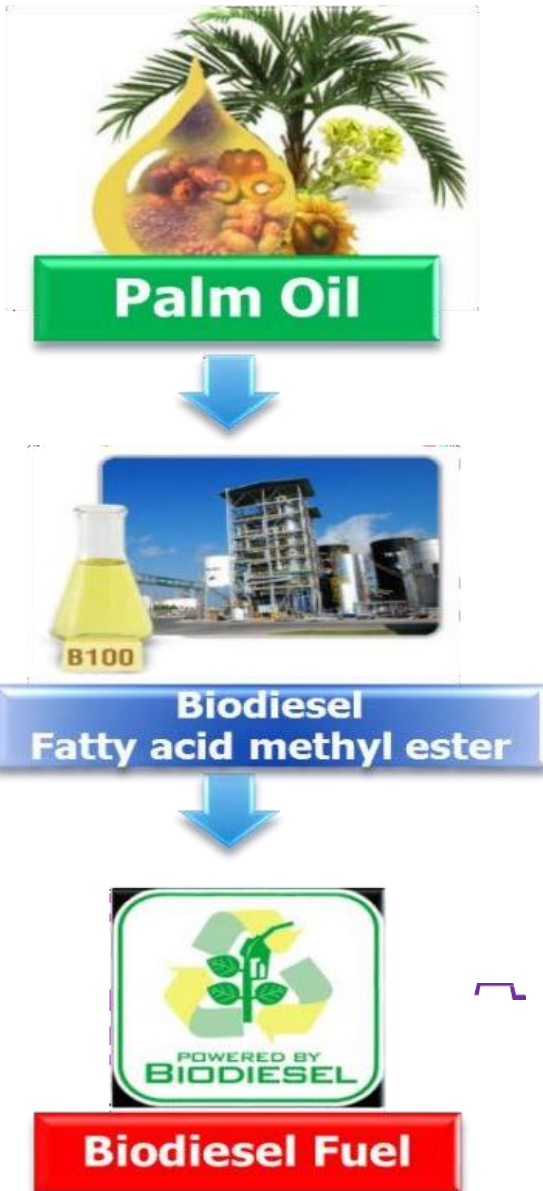
- Enhancing RE production & Utilisation in every sector
- Enhancing Energy Efficiency in every sector



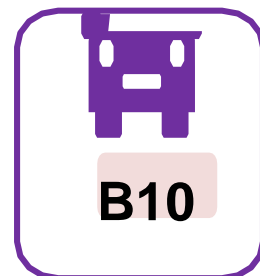
Biofuel raw material supply (tons)



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Year	2021
1. Molasses	3,228,976.95
2. Cane Juice	693,346.62
3. Cassava	3,127,289.42
4. CPO	1,146,381



Biofuel Plants

Ethanol

Year	2021
1. Number of Factories (Plants)	27
2. Installed Capacity (MLPD)	6.57
3. Produce (ML)	1,325.92
(MLPD)	3.63

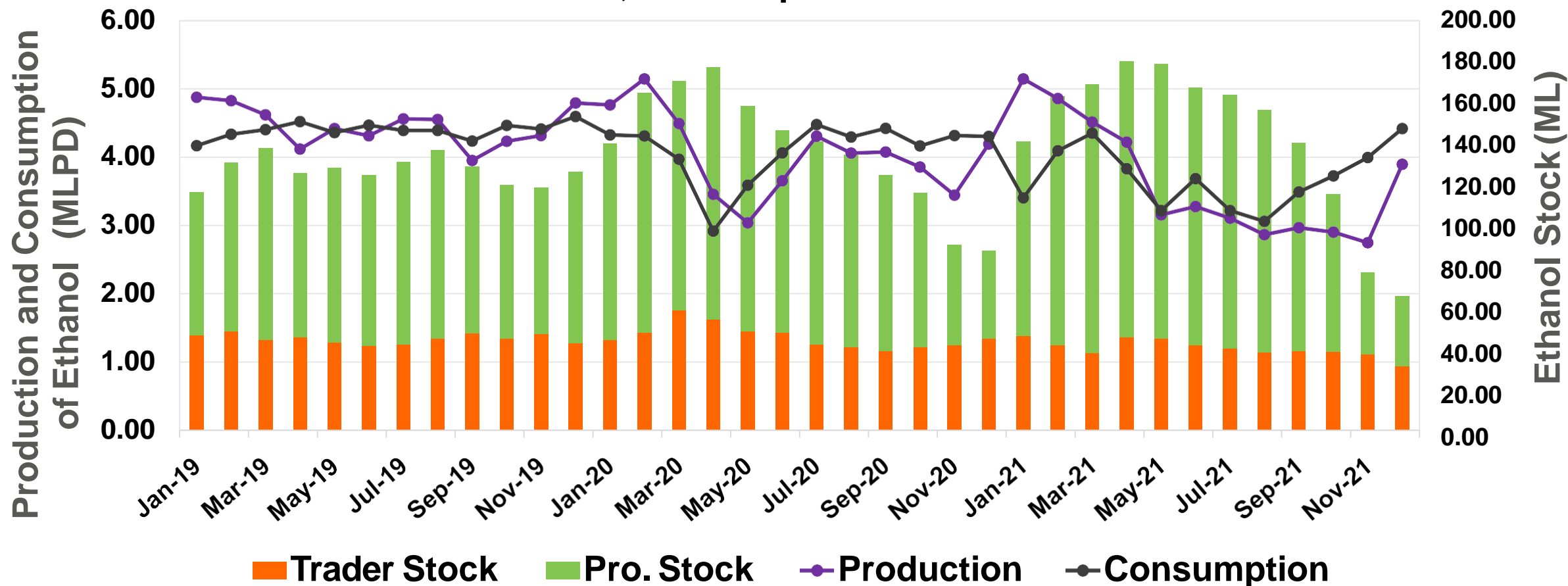
Biodiesel

Year	2021
1. Number of Factories (Plants)	14
2. Installed Capacity (MLPD)	9.40
3. Produce (ML)	1,657.99
(MLPD)	4.54



Ethanol

Production, Consumption and Stock of Ethanol





PRICE STRUCTURE OF PETROLEUM PRODUCT IN BANGKOK

9-May-22

UNIT:BAHT/LITRE	EX-REFIN.	TAX	M. TAX	OIL	CONSV.	WHOLESALE	VAT	WS&VAT	MARKETING	VAT	RETAIL
	(AVG)	B./LITRE	B./LITRE	FUND	FUND	PRICE(WS)			MARGIN		
ULG	31.0908	6.5000	0.6500	7.1800	0.0050	45.4258	3.1798	48.6056	0.6116	0.0428	49.26
GASOHOL95 E10	29.9829	5.8500	0.5850	1.0200	0.0050	37.4429	2.6210	40.0639	1.6692	0.1168	41.85
GASOHOL91	29.5563	5.8500	0.5850	1.0200	0.0050	37.0163	2.5911	39.6074	1.8435	0.1290	41.58
GASOHOL95 E20	29.2128	5.2000	0.5200	0.1200	0.0050	35.0578	2.4540	37.5118	3.0170	0.2112	40.74
GASOHOL95 E85	27.2889	0.9750	0.0975	-2.5300	0.0050	25.8364	1.8085	27.6449	6.6309	0.4642	34.74
H-DIESEL B7	36.2704	3.2000	0.3200	-11.2200	0.0050	28.5754	2.0003	30.5757	1.2750	0.0893	31.94
H-DIESEL	36.2704	3.2000	0.3200	-11.2200	0.0050	28.5754	2.0003	30.5757	1.2750	0.0893	31.94
H-DIESEL B20	36.2704	3.2000	0.3200	-11.2200	0.0050	28.5754	2.0003	30.5757	1.2750	0.0893	31.94
FO 600 (1) 2%S	26.3165	0.6400	0.0640	0.0600	0.0050	27.0855	1.8960	28.9815			
FO 1500 (2) 2%S	24.7108	0.6400	0.0640	0.0600	0.0050	25.4798	1.7836	27.2634			
LPG (UNIT:BAHT/KILO)	31.6514	2.1700	0.2170	-17.7934	0.0000	16.2450	1.1372	17.3821	3.2566	0.2280	20.87

Exchange Rate = 34.5380 BAHT/\$

Ethanol Reference Price = 26.43 BAHT/LITRE

Biodiesel(B100) Reference Price = 62.74 BAHT/LITRE

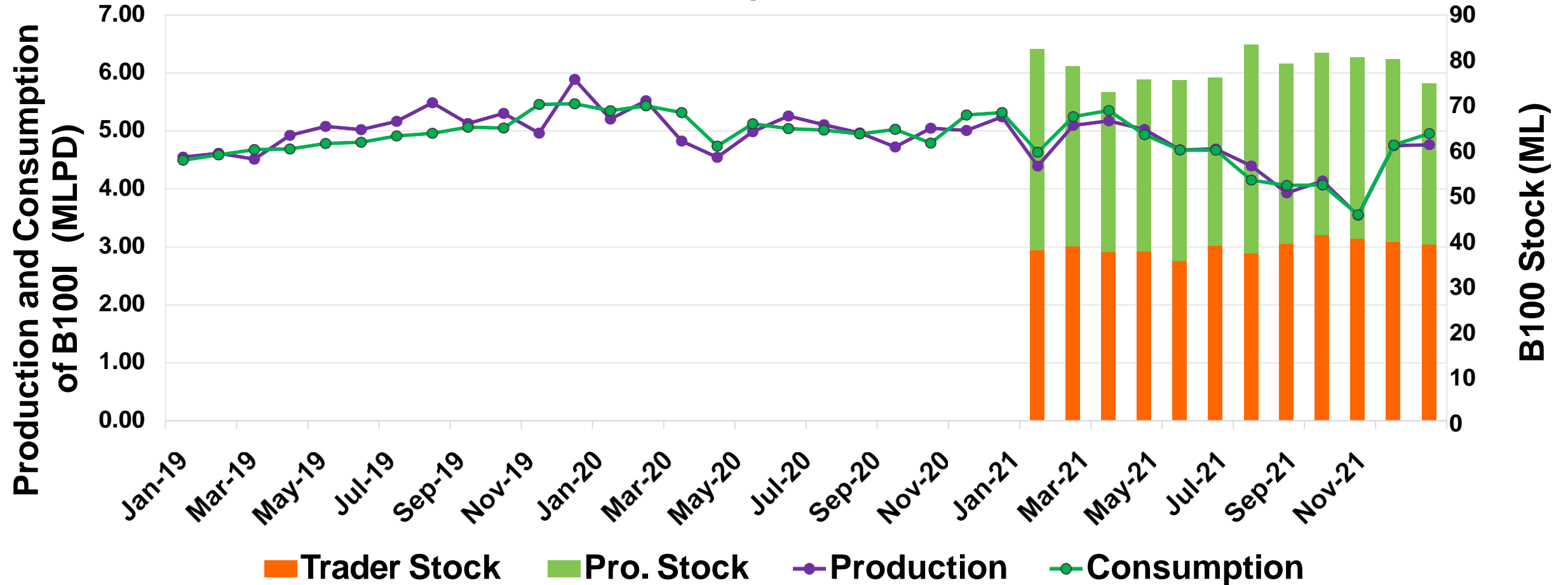
Vehicles in Thailand (2021)

Car Fuel Type	Amount (cars)	Motorcycle Fuel Type	Amount (cars)
ULG and E10	3,113,568	ULG and E10	2,481,394
E20	3,706,941	E20	18,769,664
E85	1,262,961	E85	586,033
Total Gasoline Cars	8,083,470	Total Gasoline Motorcycles	21,837,091

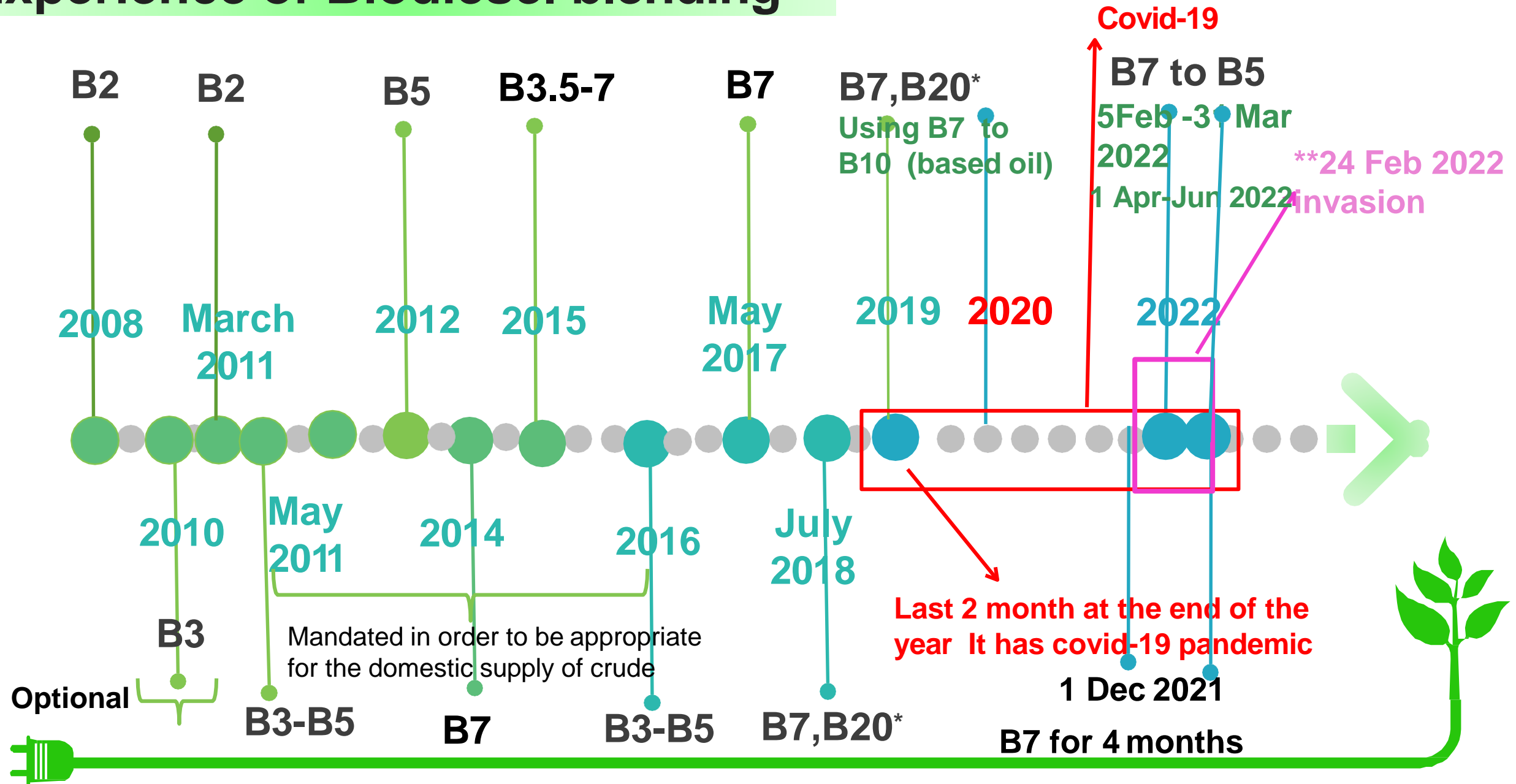
Car Type	Amount (cars)
Passenger Car ≤ 7 people	3,247,486
Passenger Car > 7 people	376,865
Van & Pick Up	6,627,908
Rental Van & Pick Up ≤ 7 people	648
Business Car + Sightseeing Car + Rental Car	2,798
Tractor + Road roller + Agricultural Vehicle	725,802
Bus	110,007
Lorry	925,133
Small Car	304
Total Diesel Cars	12,016,951

Biodiesel

Production, Consumption and Stock of B100



Experience of Biodiesel blending



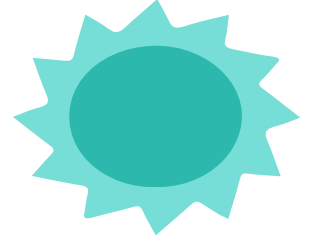


Future Biotechnology



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- Separations**
- Chemical Catalysis for Bioenergy**
- Bio-manufacturing pipeline**
- Feedstock conversion**
- Computational Physics & Chemistry**

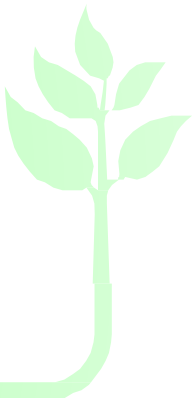


Biofuel R&D Projects 2022



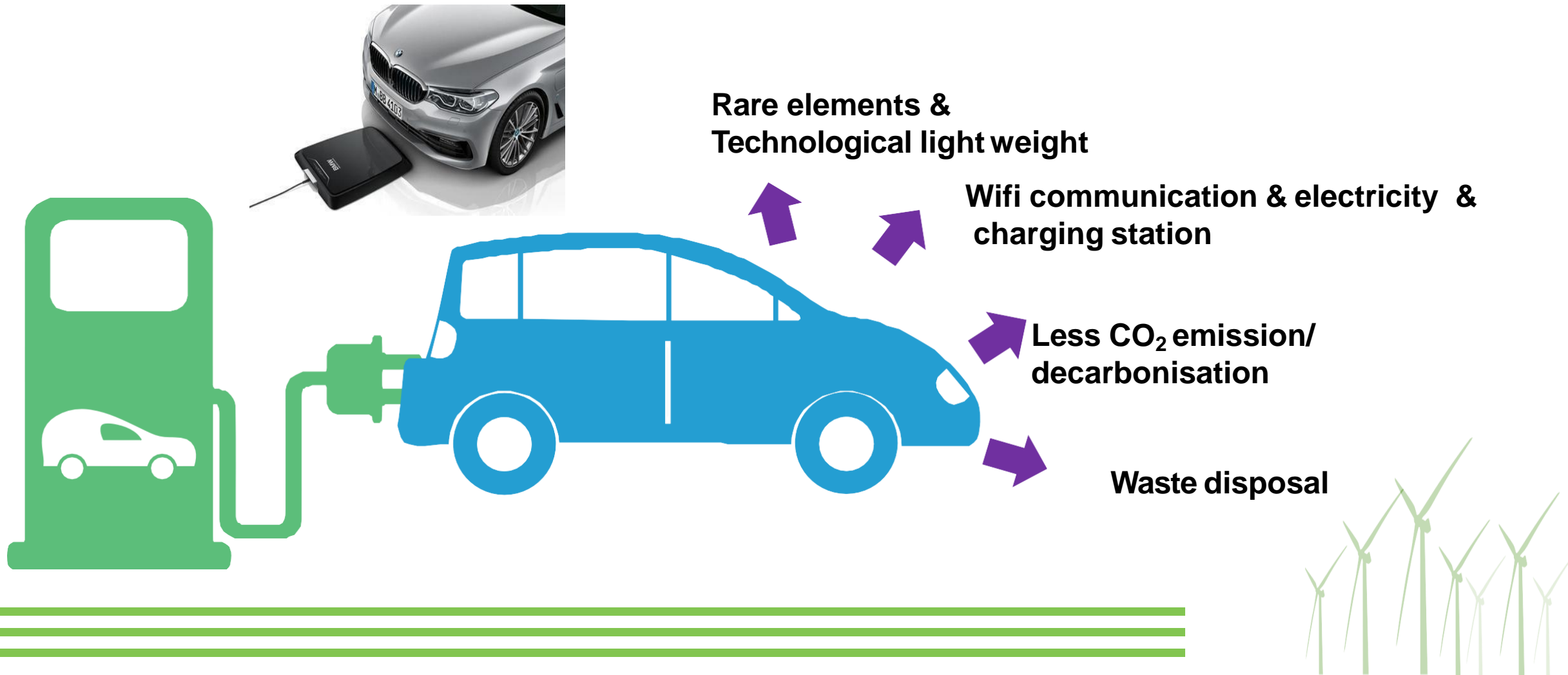
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- UNIDO-PAGE country-DEDE : Green Economy
- UNIDO-KEA-DEDE :Effects of Biofuel vs EV, 100% RE in industrial sector roadmap
- DEDE- NREL: Studying impacts of Biofuel vs. EV
- Marine Dept-PCD-DEDE- International Marine Organisation: International Meeting of the working group on reduction of GHGs from Ships
- DEDE:EURO 5 : Following the regulation using Euro5 in 2024
- DEDE: Studying high value products
- DEDE: Increasing high productivity (high efficiency /high yield)



Global Technological Innovation

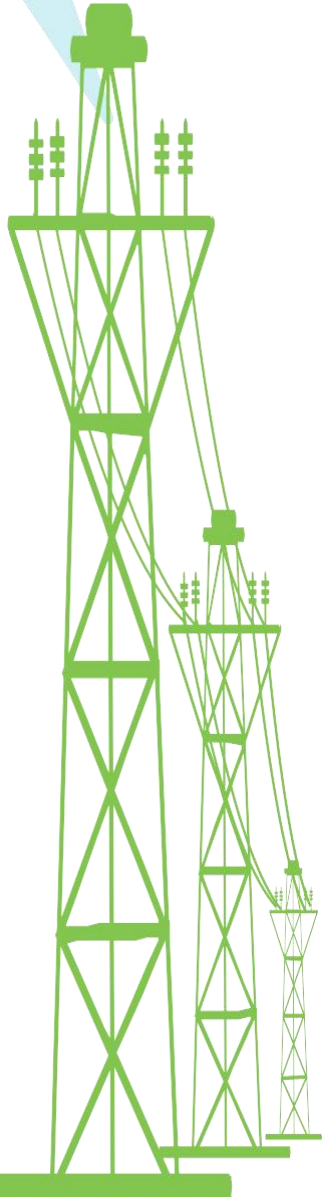
EV in Norway : using Wireless charging : 200 KW for 100% personal car



Conclusion



- **Decarbonisation/Net zero**
- **Energy transition or Energy Mix**
- **Biofuel & EV Impact**
- **New technology & Innovations : develop high yield & efficiency of the production process, high value added products**
- **BCG Model, Green Economy**





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Thank You for Your Attention

GOAL

