

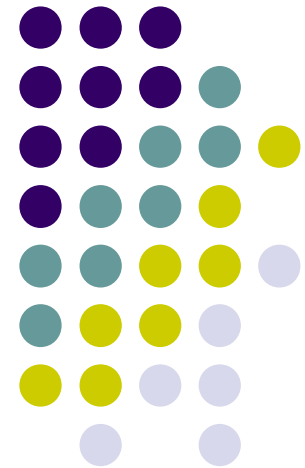
Franco-Thai Seminar on “The Technological and Infrastructural Challenges of Building a Low-carbon Economy”

8 – 9 October 2009

Dusit Thani Hotel, Bangkok

Bio-ethanol Option for the Transportation Sector in Thailand and Its GHG Emission Reduction

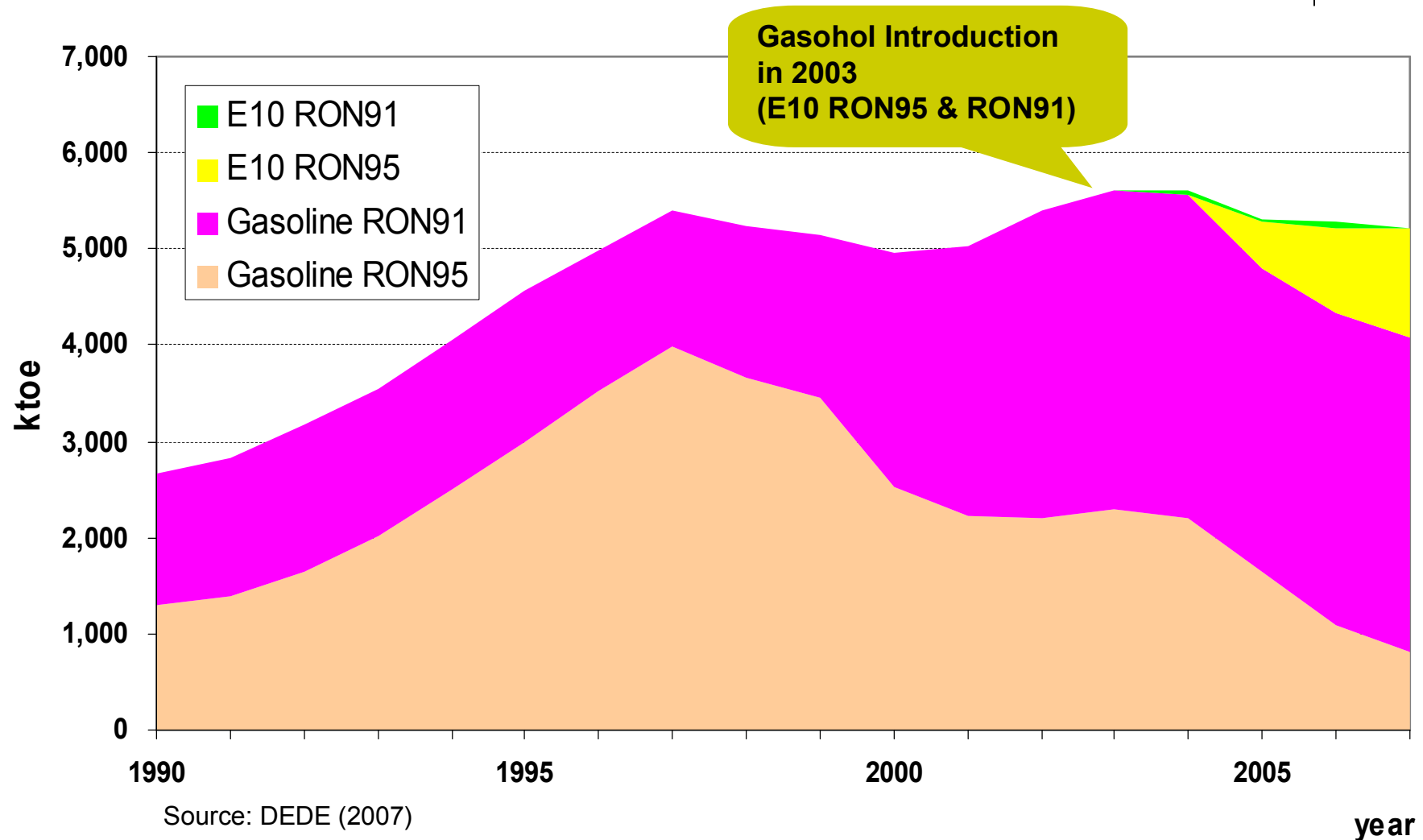
Asst. Prof. Dr. Chumnong Sorapipatana



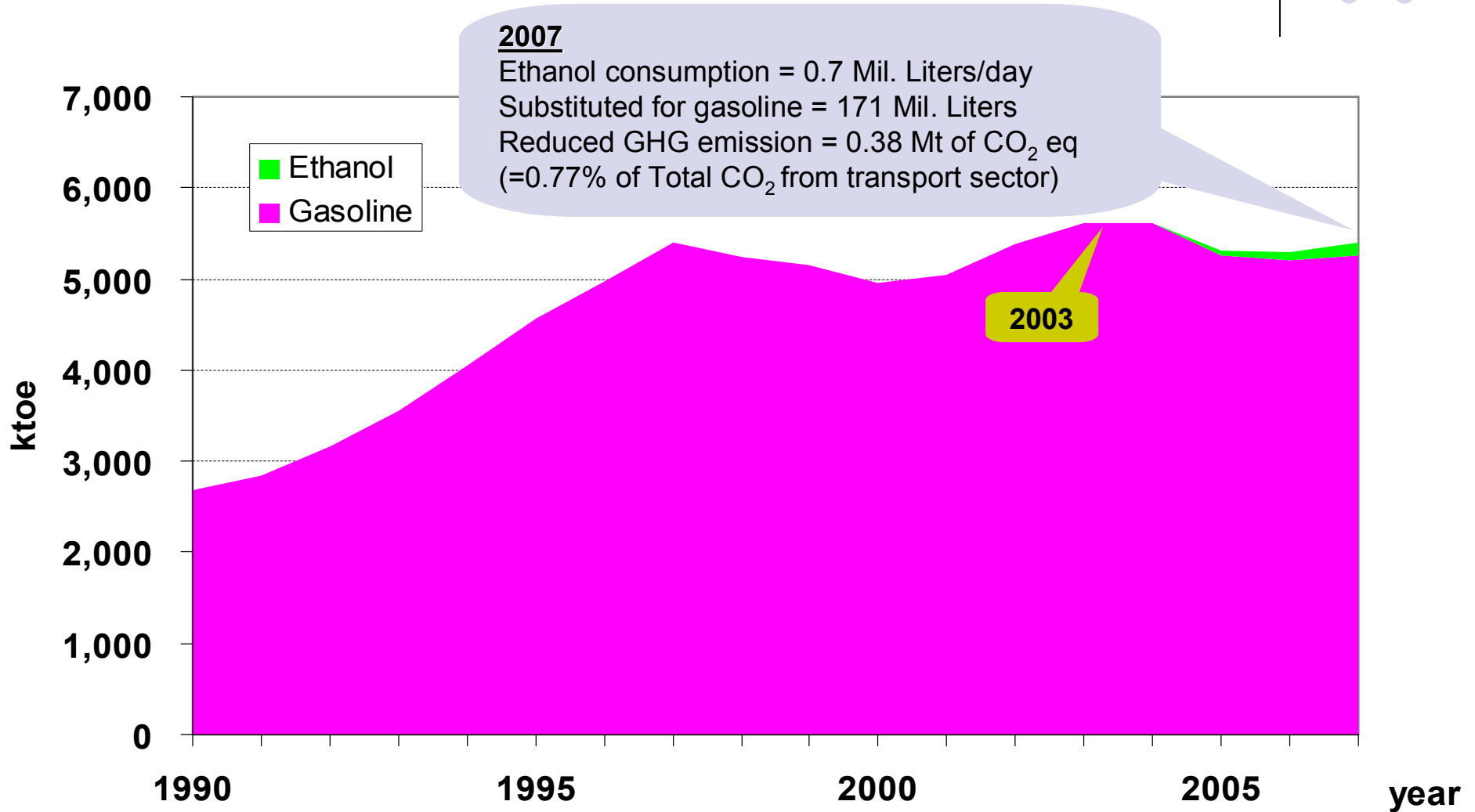
Development of National Ethanol Plan of Thailand



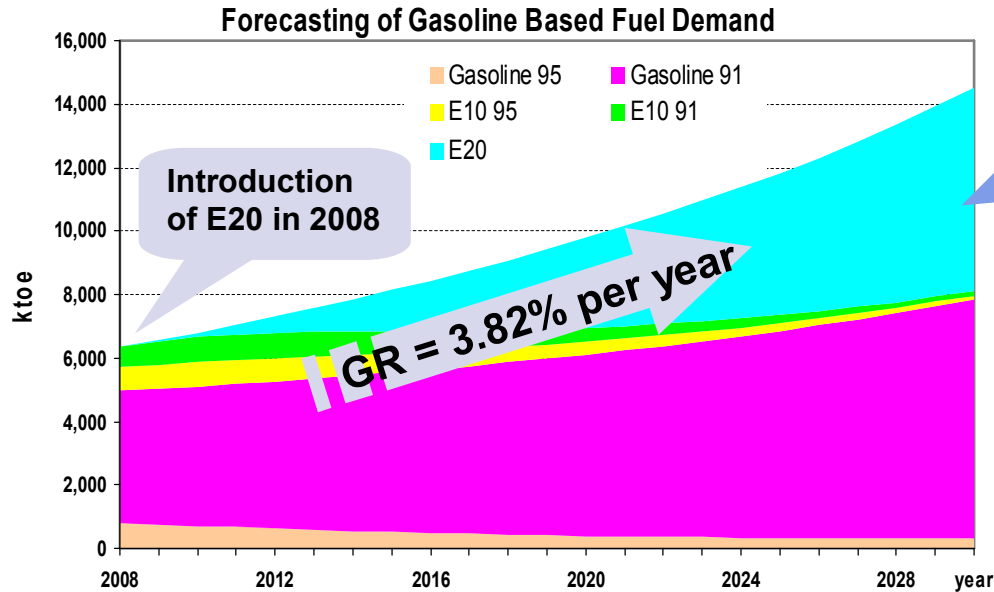
Current Situation of Ethanol Demand in the Road Transport Sector in Thailand



Current Situation of Ethanol Demand in the Road Transport Sector in Thailand



Forecasting of Gasoline Demand and GHG Emissions

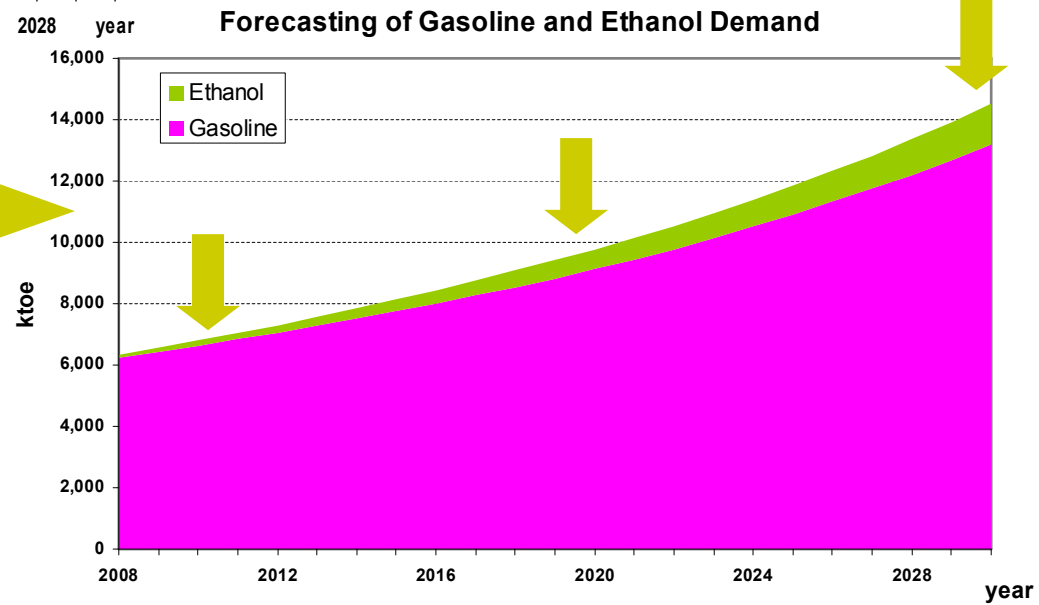


Total Spark Ignition fuel demand as of gasoline equivalence

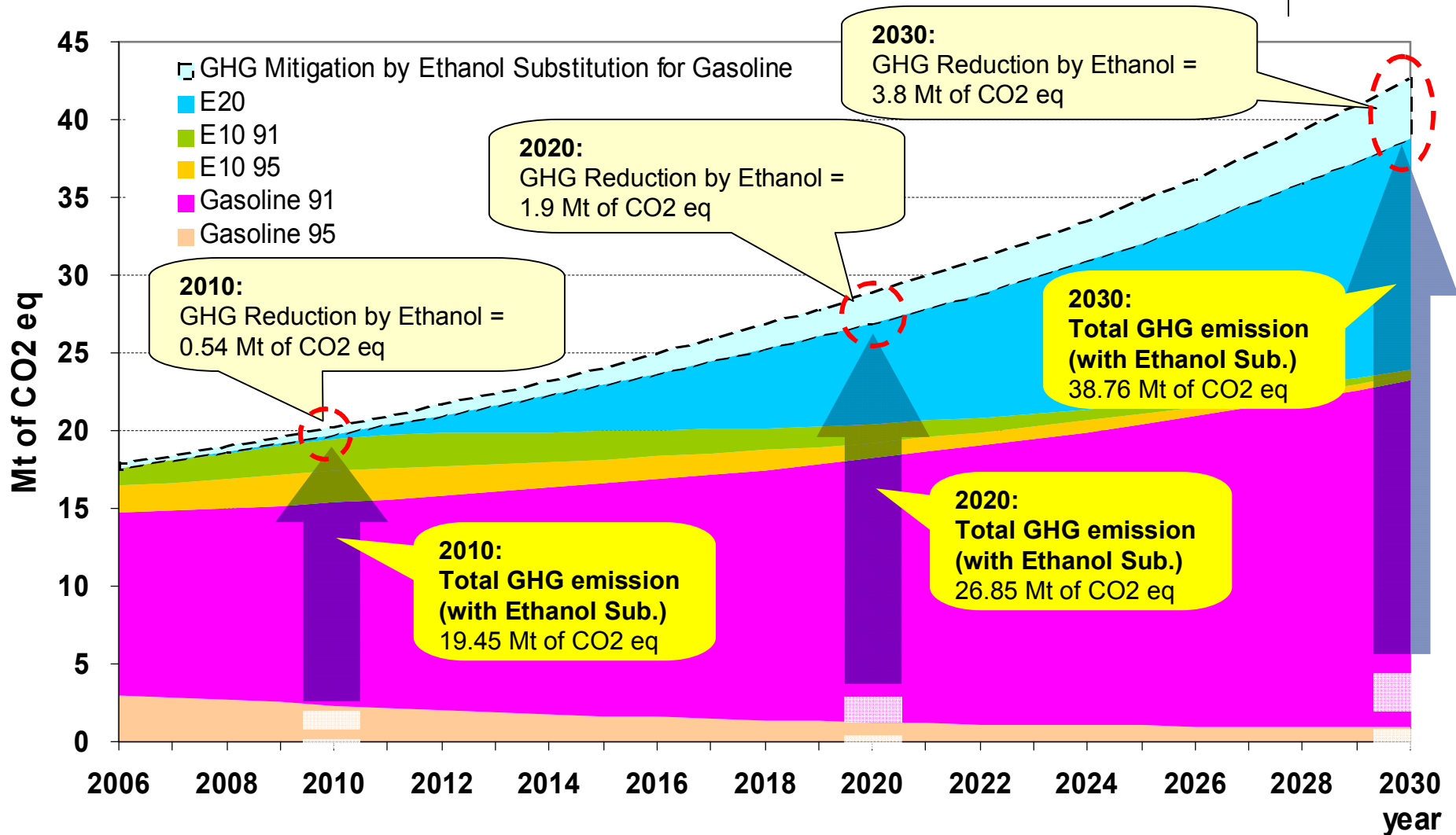
2010: 6,621 ktoe/yr
2020: 9,779 ktoe/yr
2030: 14,515 ktoe/yr

Demand of Ethanol (Substitute for gasoline)

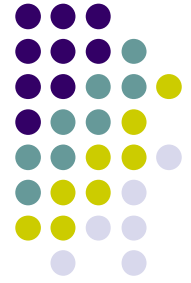
2010: 1.0 ML/yr (0.66 ML/d)
2020: 3.5 ML/yr (2.32 ML/d)
2030: 7.1 ML/yr (4.68 ML/d)



GHG Emission from Gasoline Consumption



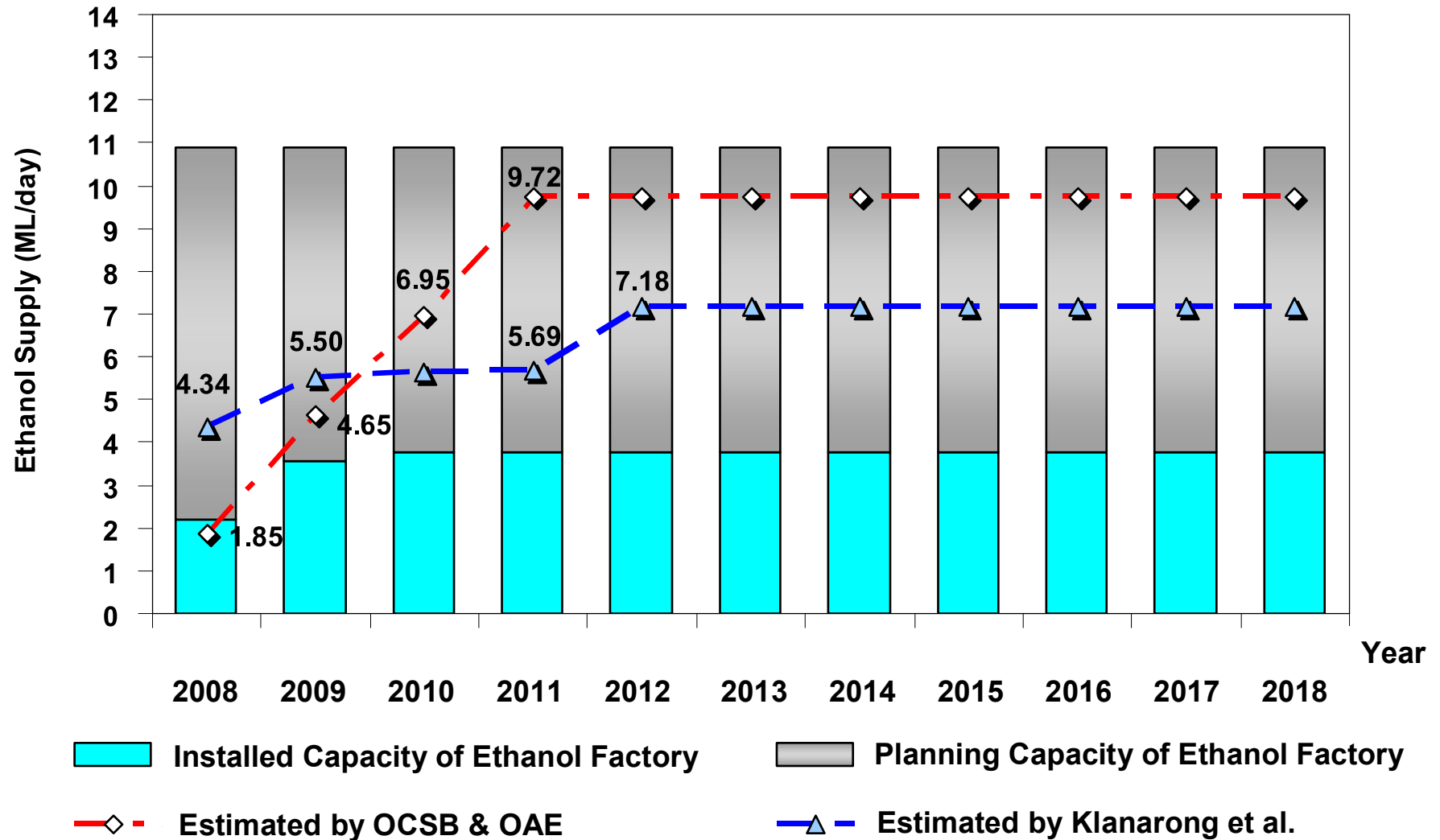
Assessment of Additional Programs for Intensive Bio-Ethanol Promotion



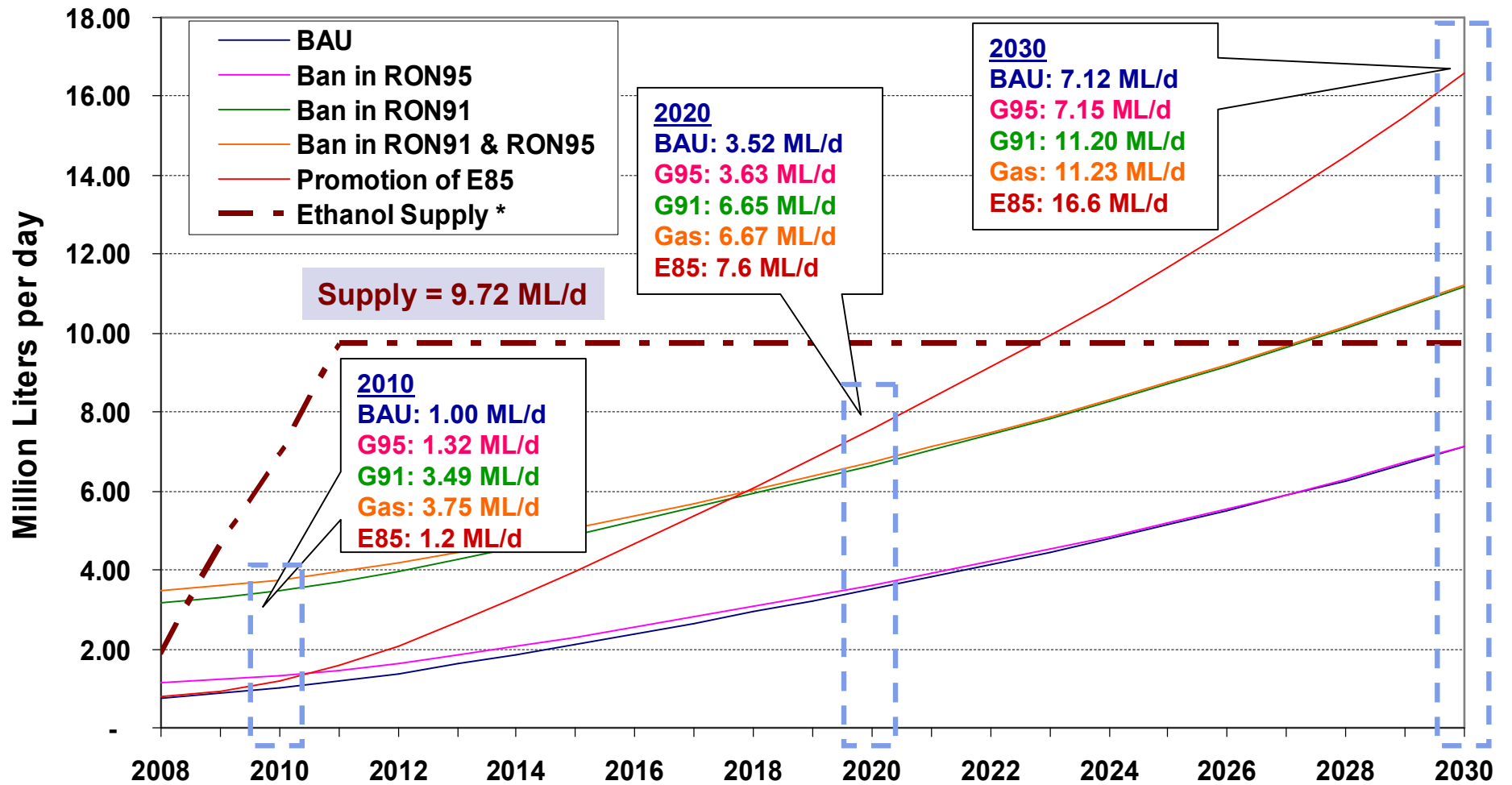
- Ban in using of Gasoline RON95
- Ban in using of Gasoline RON91
- Ban in using of Gasoline RON95&RON91
- Promotion of E85 (under assumption that private cars with 2.0 L engines or greater are encouraged to use FFV by low tax incentive and all of them are mandated to be FFV after 2018)



Supply of Ethanol



Ethanol Demand for Gasoline Substitution

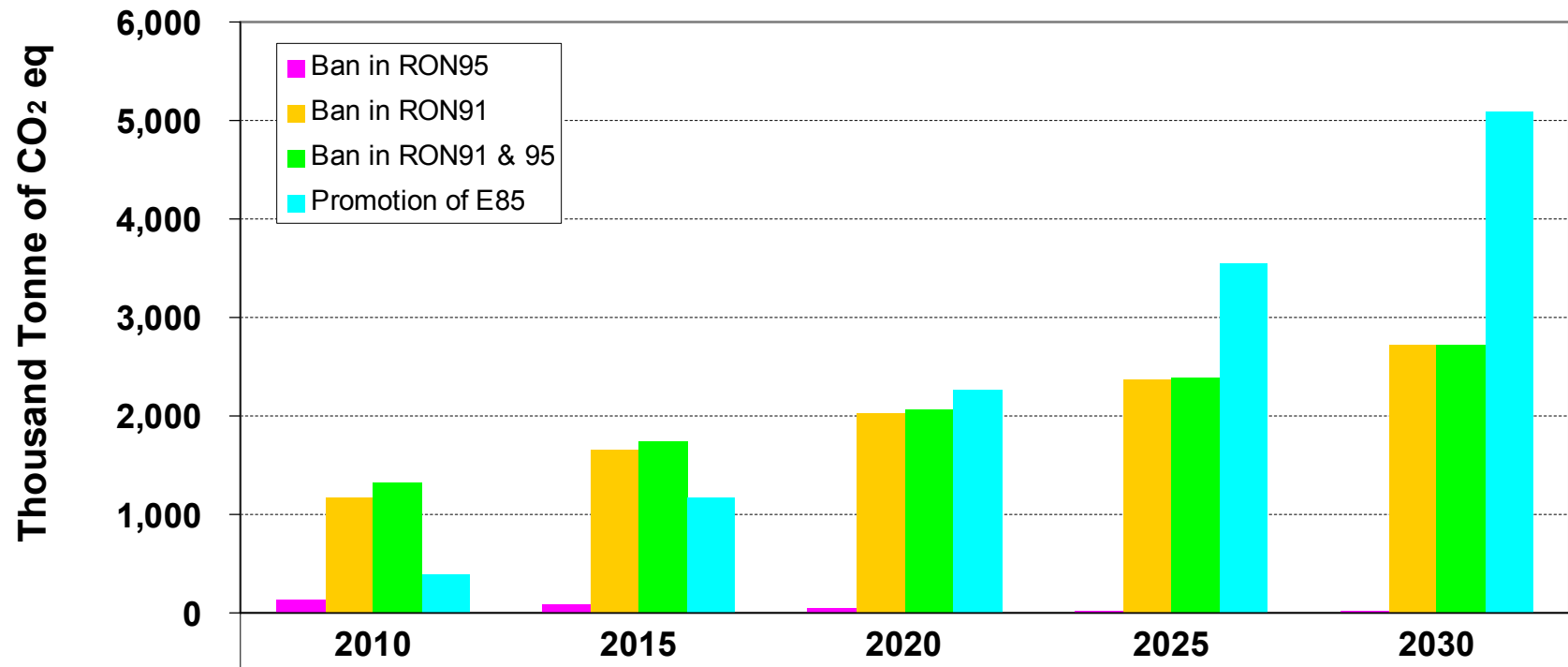
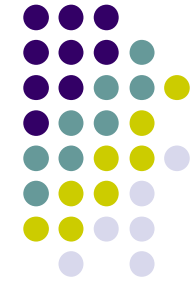


* Source: Office of the Cane and Sugar Board (2008) and Office of Agricultural Economic (2008)

year

GHG Emission Mitigation

(Differential from BAU Scenario)



■ Ban in RON95	139 (0.7%)	84 (0.4%)	47 (0.2%)	26 (0.1%)	15 (0.04%)
■ Ban in RON91	1,181 (6.0%)	1,645 (7.2%)	2,020 (7.5%)	2,359 (7.4%)	2,709 (7.0%)
■ Ban in RON91 & 95	1,320 (6.7%)	1,729 (7.6%)	2,067 (7.7%)	2,385 (7.5%)	2,724 (7.04%)
■ Promotion of E85	396 (2.0%)	1,170 (5.1%)	2,270 (8.4%)	3,542 (11.0%)	5,078 (13.1%)

(% of Total CO₂ Emission from Gasoline Consumption)

Discussion and Conclusion



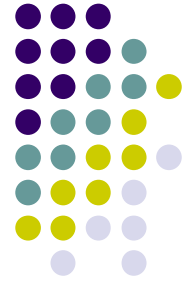
- Ban on gasoline octance 95 (RON 95) is unlikely to boot up ethanol demand significantly in Thailand because more than 70% of spark ignition fuel is RON 91.
- Only ban on 91 will cause significantly demand in ethanol immediately. However, is consequence impact due to short of supply of ethanol as of limitation of plants' capacities needed to be caution. Currently, only a few projects of ethanol plants are really implemented.

Discussion and Conclusion

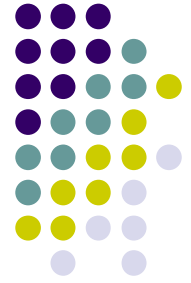


- Based from TRF sponsored study, they found that, if there is no establishment of more capacity and RON 91 is banned, the production capacity will be the bottle neck of ethanol production in next 2 years.
- Implementation of FFV is unlikely to give any significant impact of ethanol demand in the short term. But its impact will strongly stimulate growth of demand in next 10 years, with a negative impact, i.e. more peoples are going to use fuel guzzling of big cars ! This would end up with inadequate supply of raw materials for the ethanol production.

Discussion and Conclusion



- The GHG reduction by ethanol substitution is now significant now (<2.5% of the total GHG emission from the spark ignition fuel in the road transport in Thailand), but it will become a significant figure in next 20 years (around 7% to 10%).



Policy Recommendations

- Ban of RON 91 can boot up the demand of bio-ethanol dramatically, but this should be implemented with caution, to make sure that there will be no disruption in the supply of bio-ethanol due to plant capacity's limitation.
- FFV should be implemented in conjunction with increasing of energy efficiency mandated.
- The promotion of high efficiency vehicles in small private cars is more important than the promotion of the FFV in large private cars, without considering their fuel economy.