



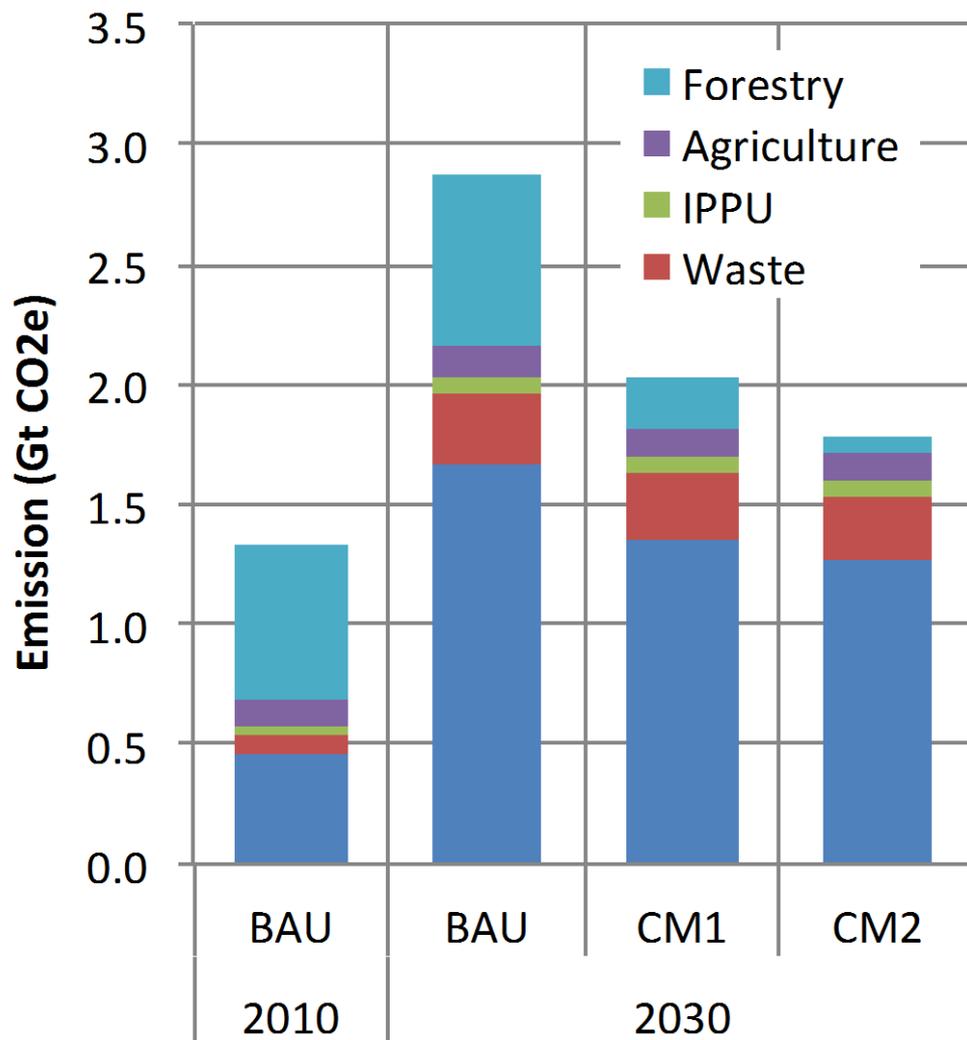
# ***Modeling of GHG Emission from Energy and AFOLU sector under the Indonesian NDC***

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# Target NDC Indonesia



- Emission reduction target will be reached mainly through two main sectors:
  - LULUCF: **60%**;
  - *Energy: 38%*

# MITIGATION ACTIONS TO MEET THE NDC EMISSION REDUCTION TARGET



## LAND USE CHANGE AND FORESTRY

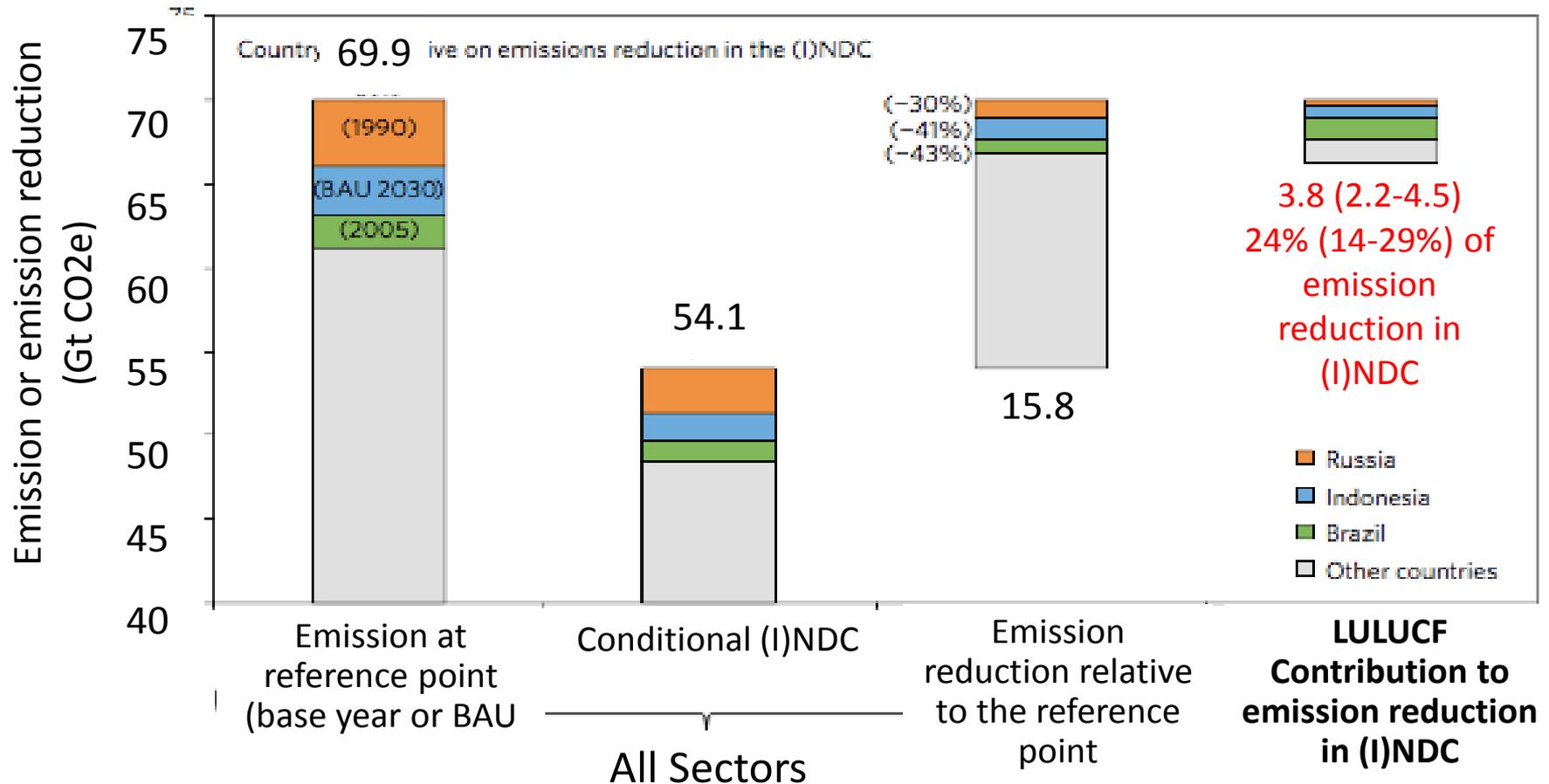
- Reducing deforestation down to 0,45 ha-0,25 Mha/year)\*
- Applying SFM principle (Mandatory for RIL)\*.
- Land rehabilitation reached 12 million ha by 2030 about 800,000 ha/year with survival rate of 90% .



- ## ENERGY
- Peat restoration 2 million ha by 2030 with successful rate of 90%. (Note: \* under RFD)
  - Efficiency in final energy consumption (75-100 % implemented)
  - Application of clean coal technology in power plant (75 % implemented)
  - Electricity generation using renewable sources (22.5% of energy mix)
  - Use of biofuel in transportation sector (90-100 % implemented)
  - Additional gas distribution lines (100 %)
  - Additional compressed natural gas fuel stations (100%)

# INDONESIAN CONTRIBUTION TO GLOBAL

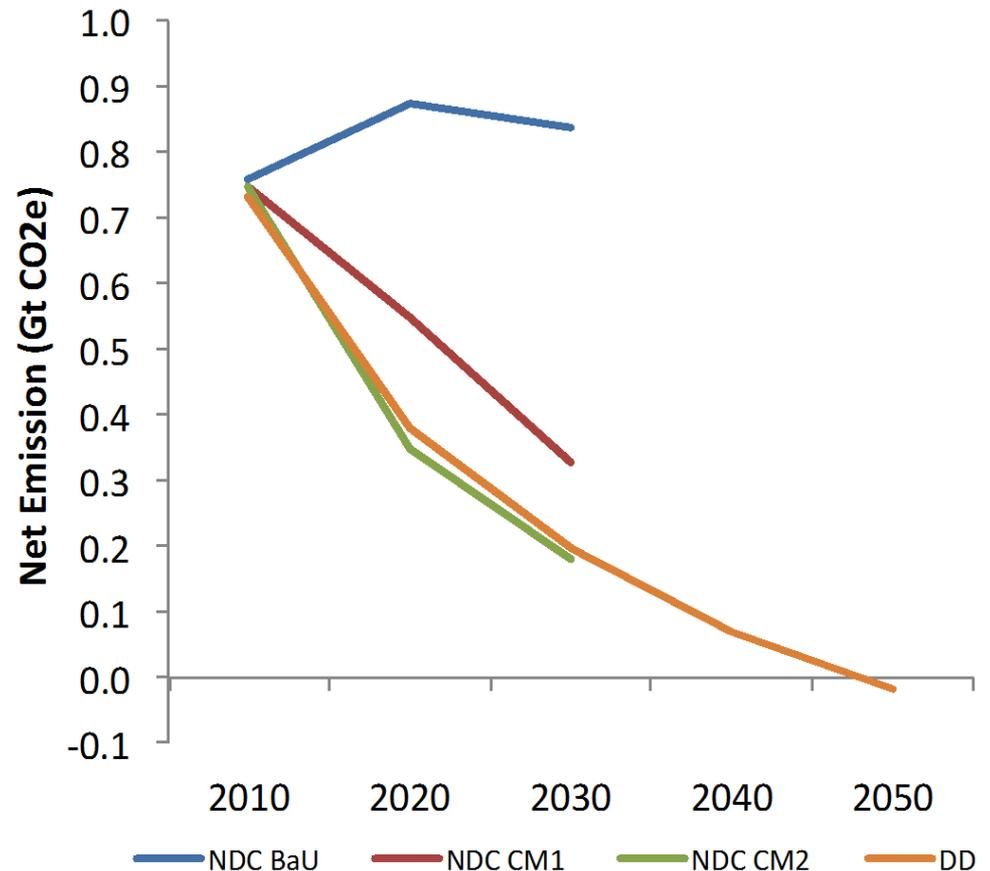
Source: Grassi et al. (2017)



- From I(NDC) the contribution of Indonesia to Global Emission Reduction Target under conditional will be about 7-8% (about 60% of this will be from LULUCF sector)
- Globally, contribution of LULUCF will be about 24% of the global emission reduction target

# Development of alternative scenarios for NDC toward food sovereignty

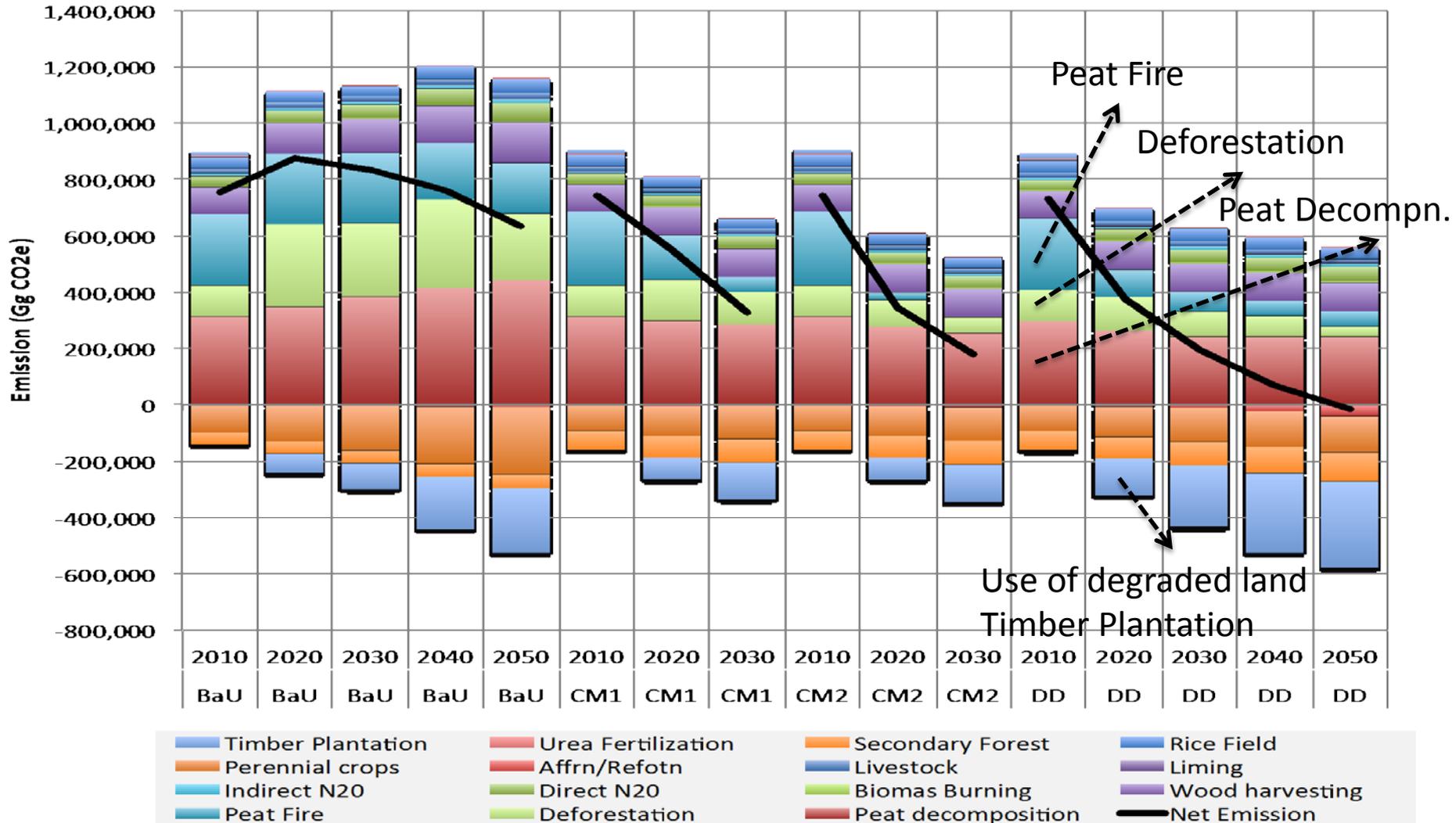
- There is a possibility to develop alternative scenario to NDC that can reduce reliance on food import and potential to reduce the emission further beyond 2030 and become net sink by 2050
- Mitigation rate should be more intensified than that NDC
- Crops productivity improvement should be further increase from the those of NDC scenarios and production target for CPO in 2050 should revisited and reduce to about half of the initial target



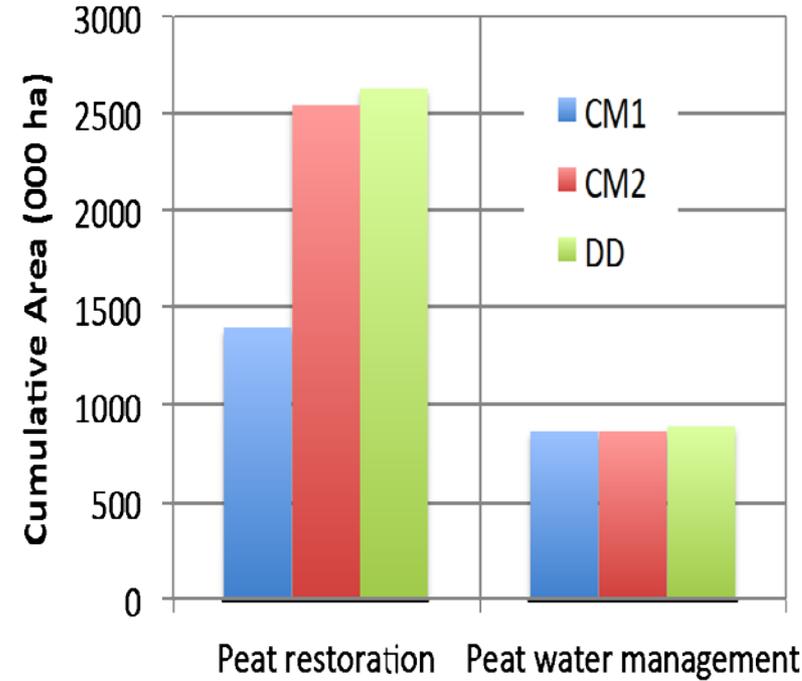
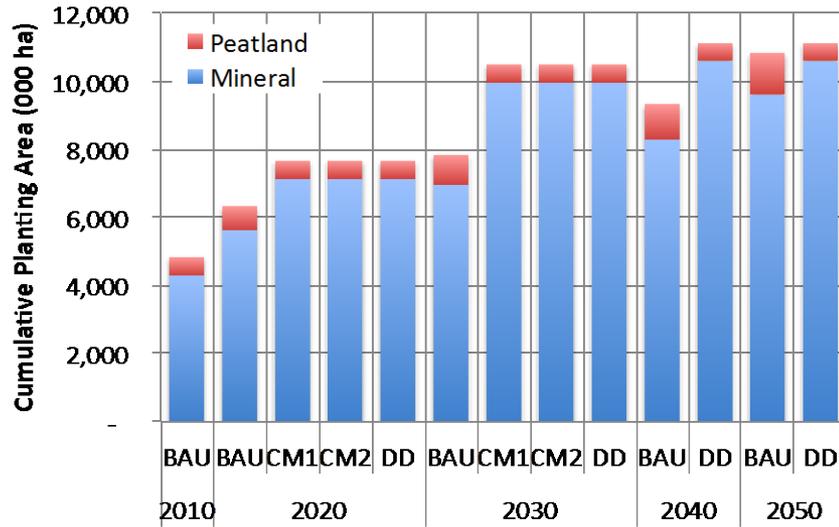
Source: Boer et al. 2017

# Emission Scenarios of NDC and DD

Source: Boer et al. 2017

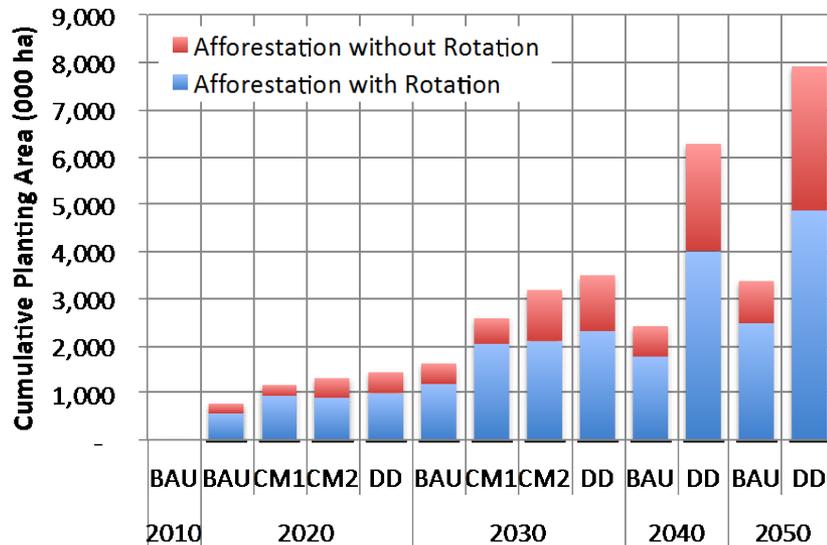


# Key mitigation actions in NDC and Alternative scenario (DD)



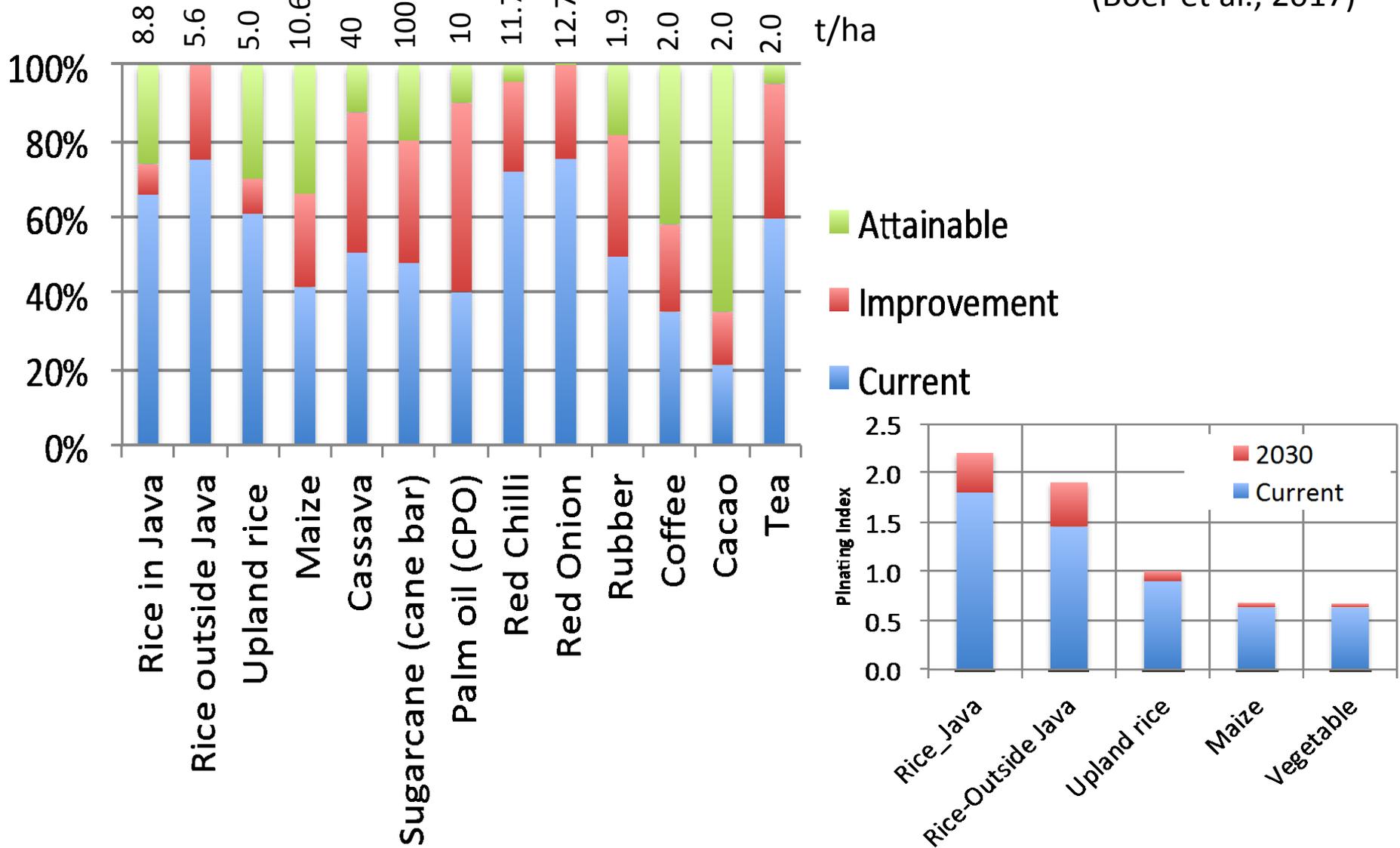
**Additional investment 2.5 billion USD (until 2030)**

Accelerating Social Forestry Program, targeting 12.7 Mha. Rate of the realization increased 7 times (60,000 ha/year (before 2016) to 570,000 ha/year (after 2016))



# Crop Productivity and PI Improvement

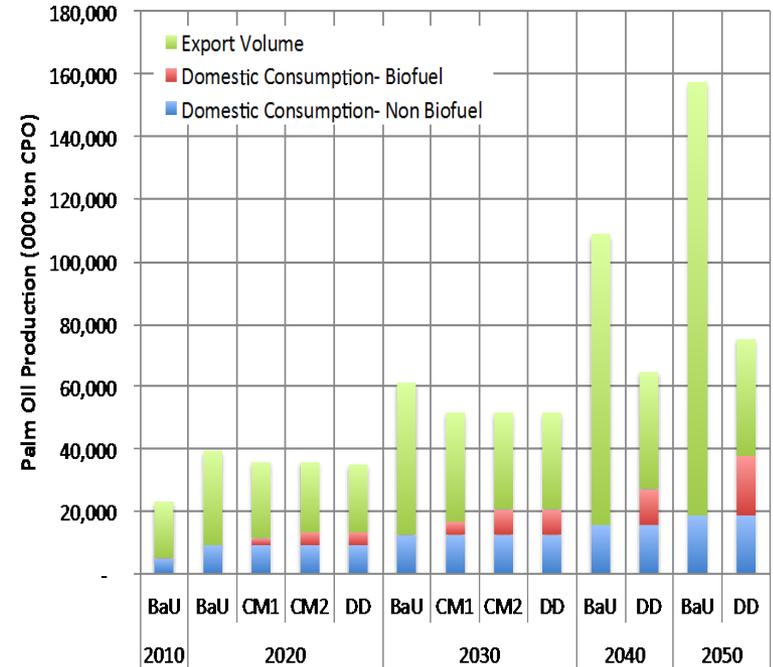
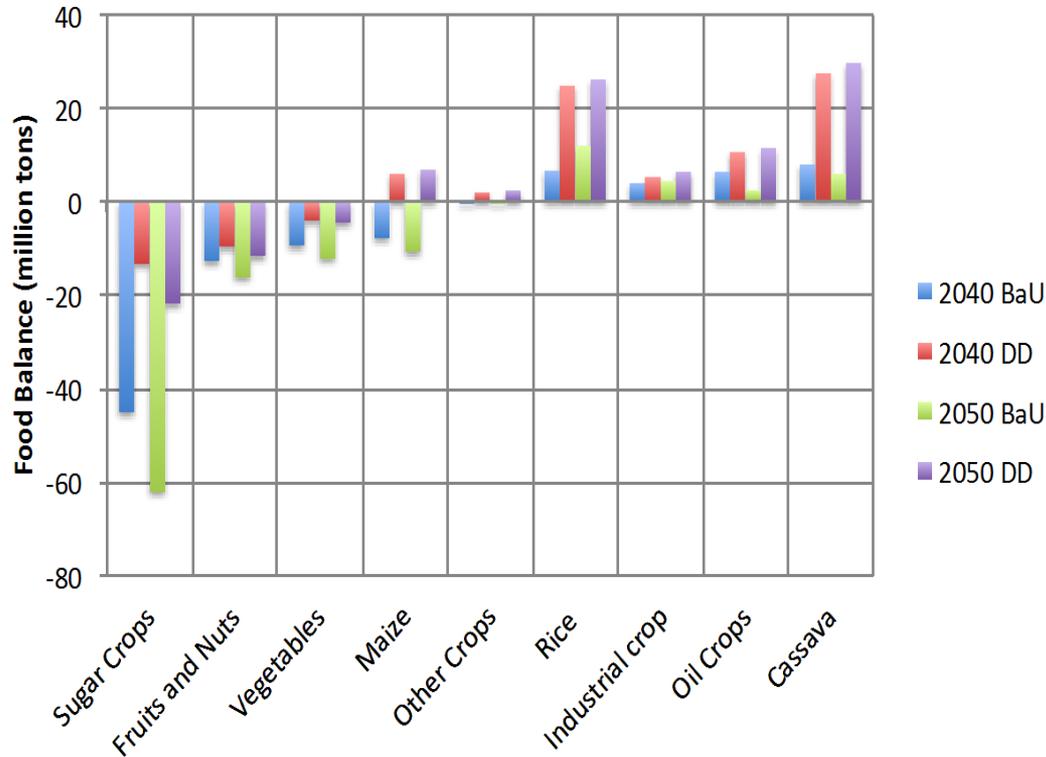
(Boer et al., 2017)



About 14 million ha of agriculture land located in forest area with very low productivity (TORA 9 Mha)

# Food Balanced & Palm Oil Production

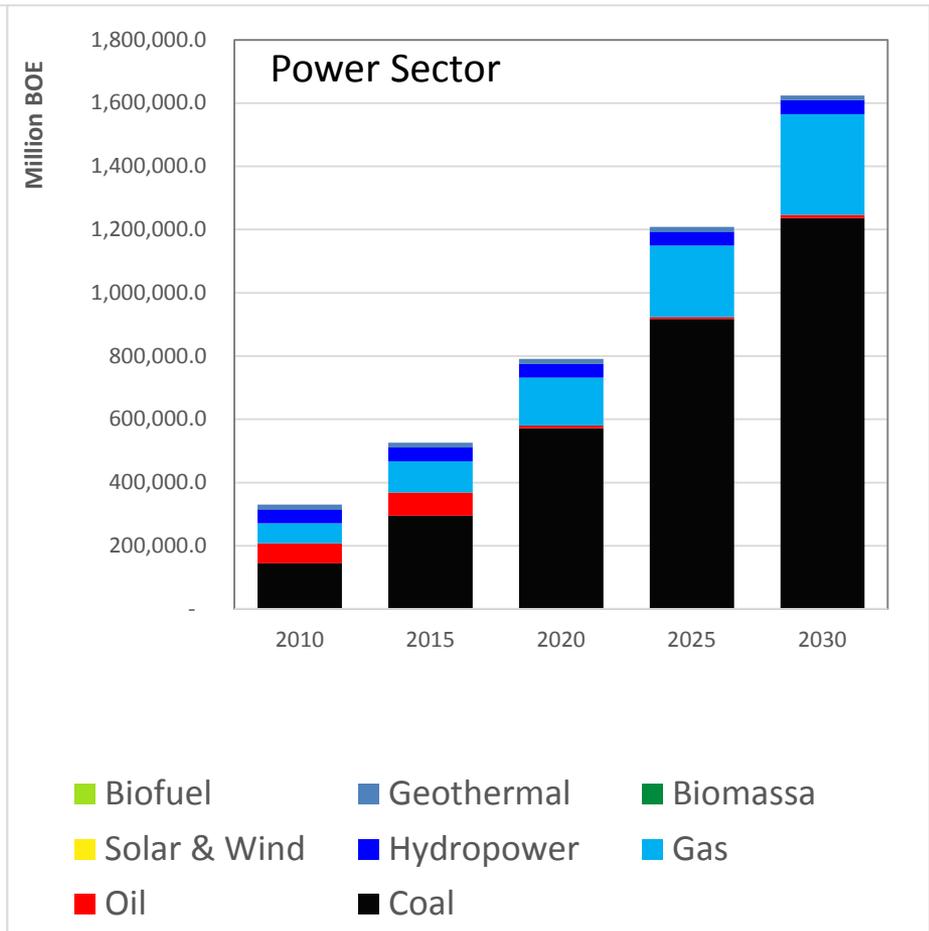
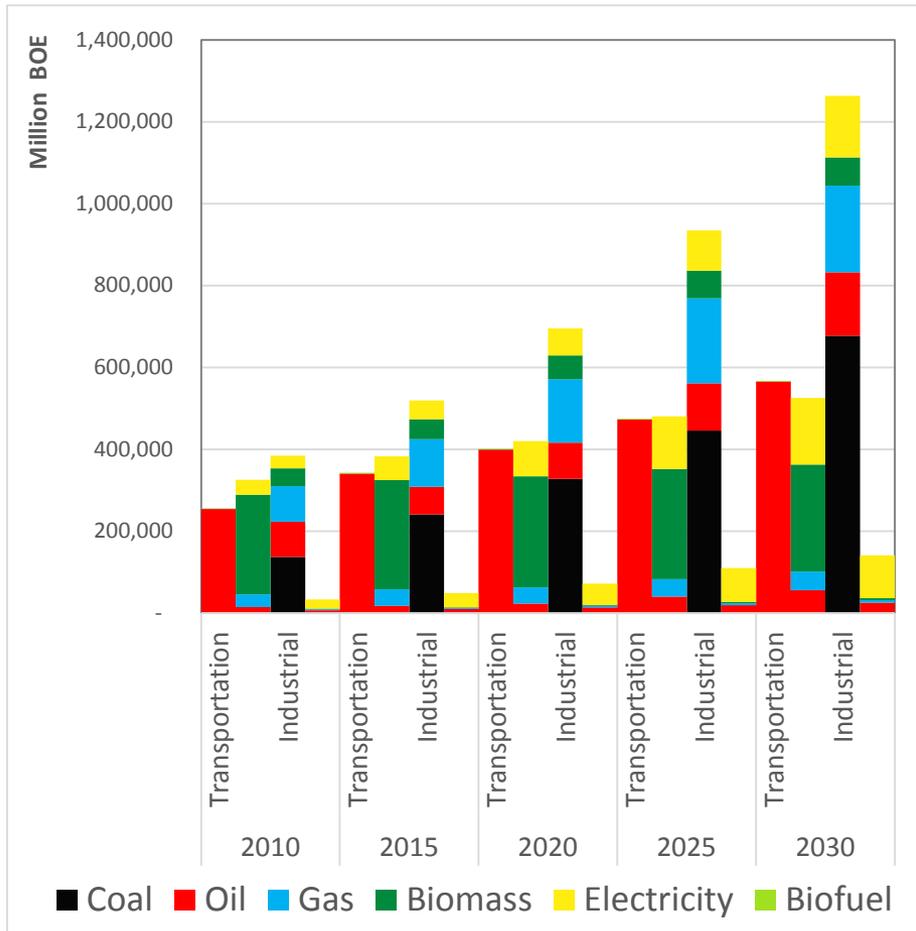
Sumber: Boer et al. 2017



- Expenses for importing food can be reduced significantly from the current level
- Indonesia can be exporting rice countries, and increase export earning of industrial crops (double of current's)

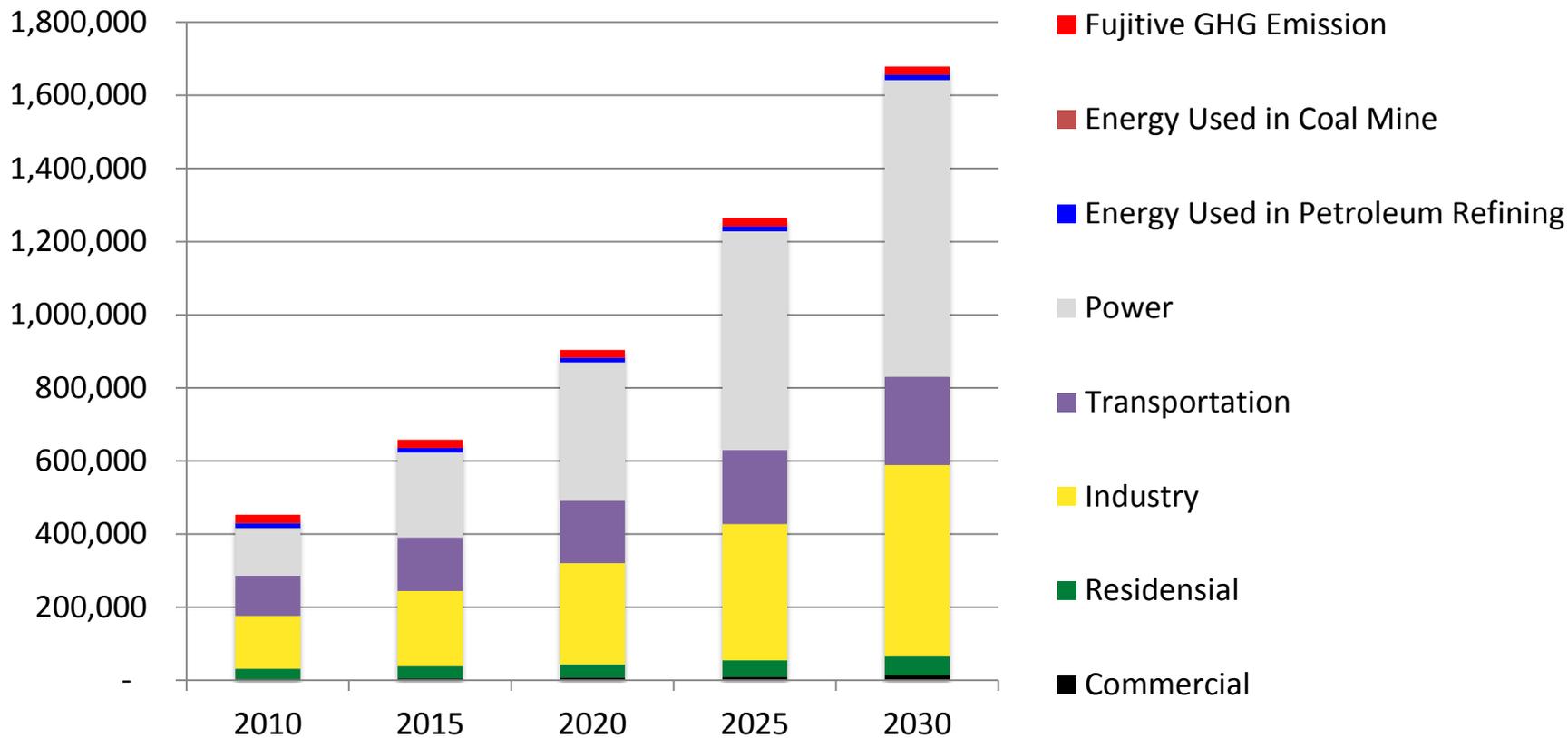
- By reducing production target of palm oil by half, production surplus of palm oil is still high
  - Enough for meeting demand for biofuel as proposed by the NDC
  - Export earning still increase of the current by almost 3 times

# ENERGY: Projection of Energy Supply Mix

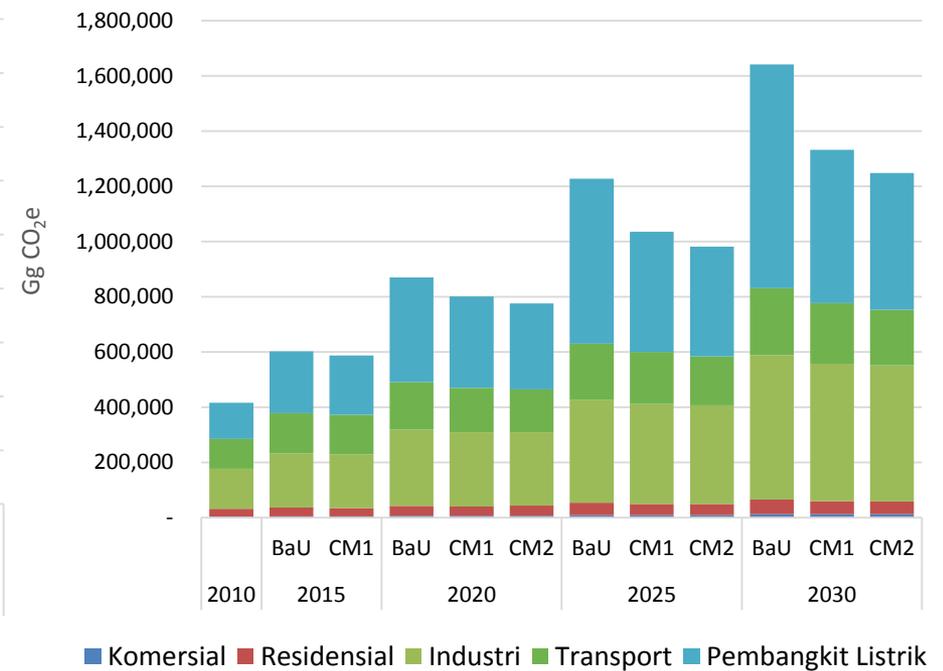
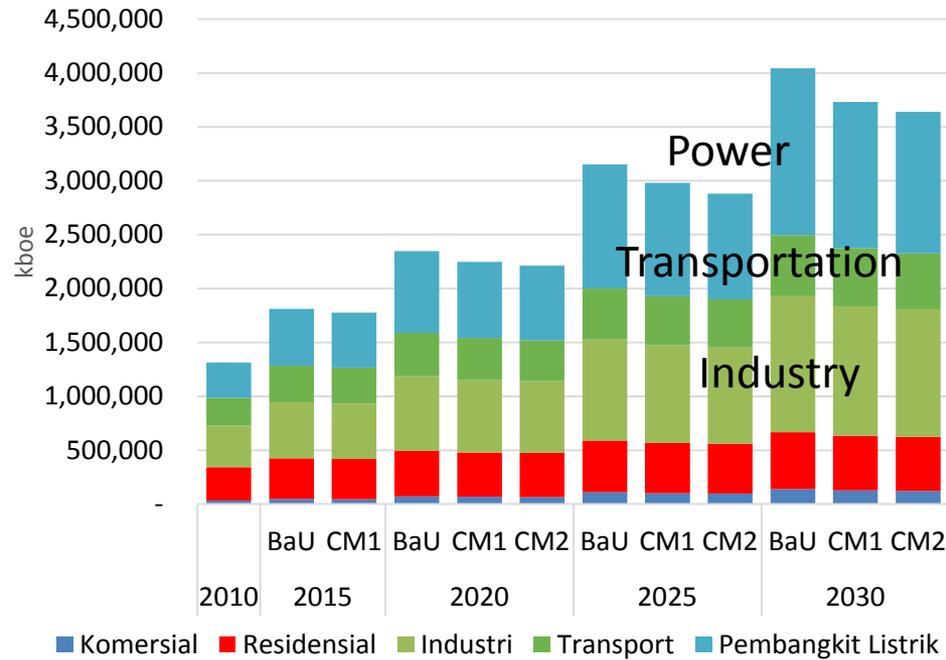


# Projection of GHG Emission Under BaU Scenario

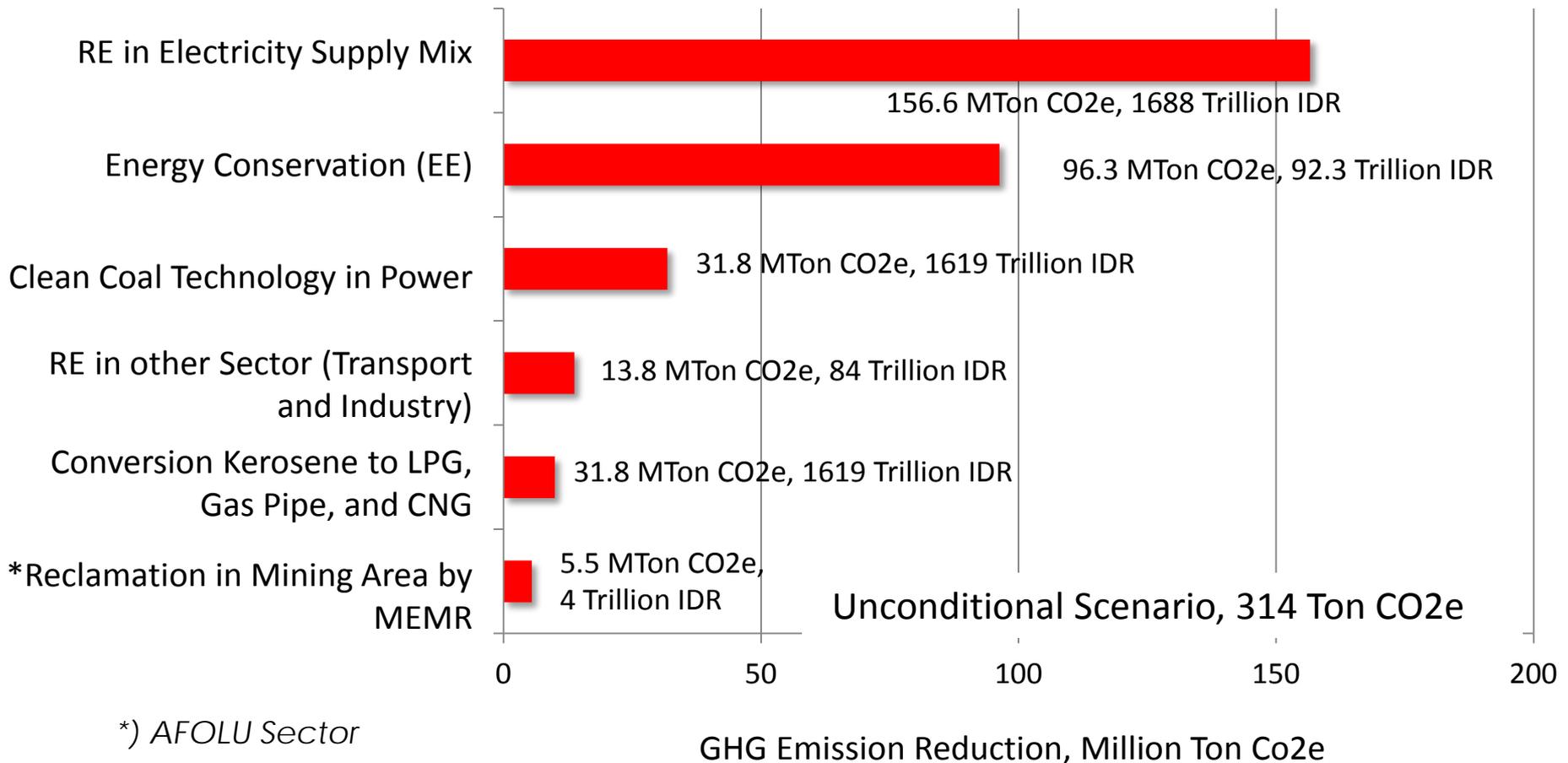
Ton CO2e



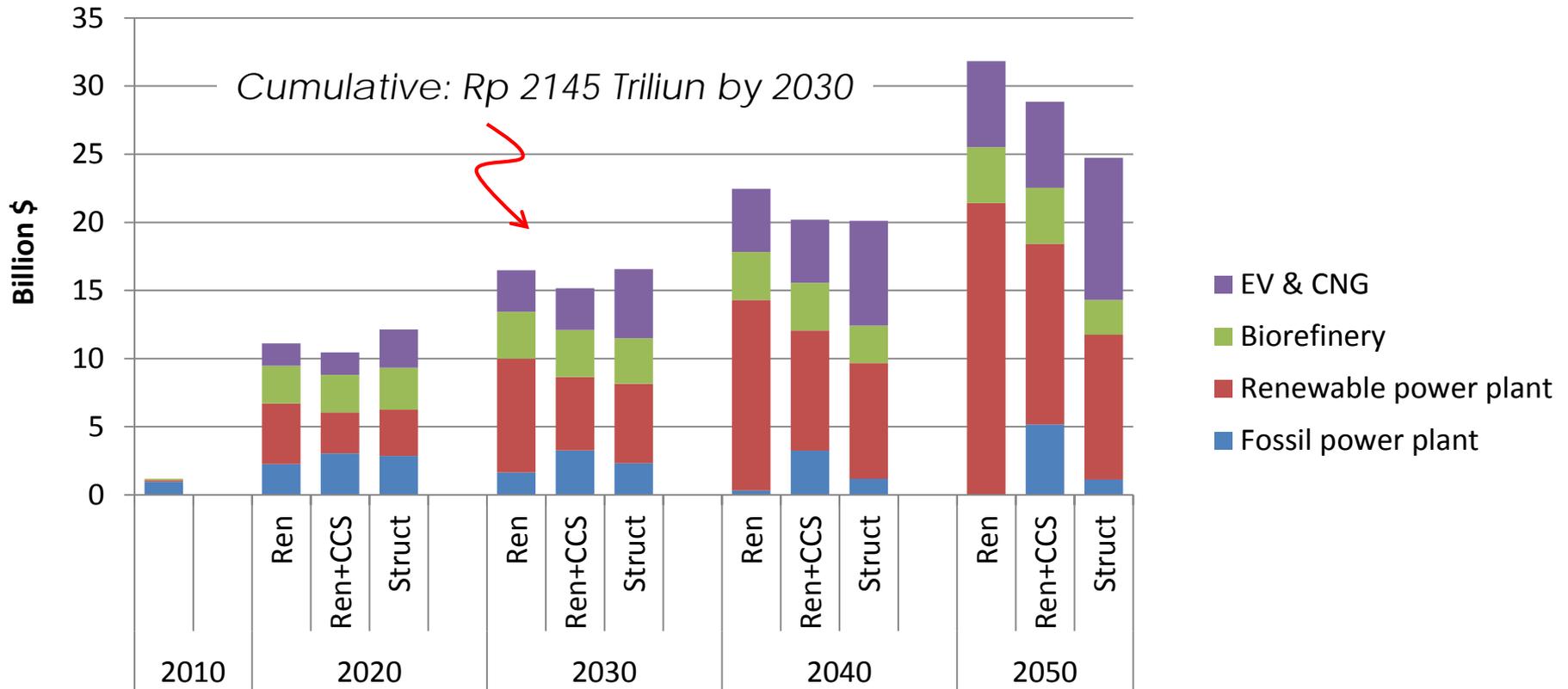
# Projection of Primary Energy Supply and Associated GHG Emission



# NDC INDONESIA: Emission Reduction Target and Cumulative Investment 2030



# Investment Requirement for “Deep Decarbonization”



Ren = RE and EE Scenario, Ren+CCS = RE plus CCS scenario, Struct = Economic Structure Change

*\*) Excluding additional infrastructure needed to support the operation of plants such as construction for gas pipelines, regasification plant (imported LNG), and to support the operation of electric vehicles or CNG such as recharging/ refueling stations; the costs associated with energy efficiency measures in buildings and industry have not been included*

# Epilogue

- Indonesian pledge is quite progressive (contribution to the global emission reduction target of (I)NDC, reaching between 7% and 8% and about 60% of it will be contributed by LULUCF
- Improvement of crop productivity and cropping intensity will be main key activities to realize the target including the restoration of peatland and limit the use of peatland for development
- Required high investment, particularly in energy sector (*clean coal technology*)
- A number of supporting policies including the financing have been issued recently