



LOW CARBON SOCIETY SCENARIOS TOWARDS 2050

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CASE STUDY – MALAYSIA

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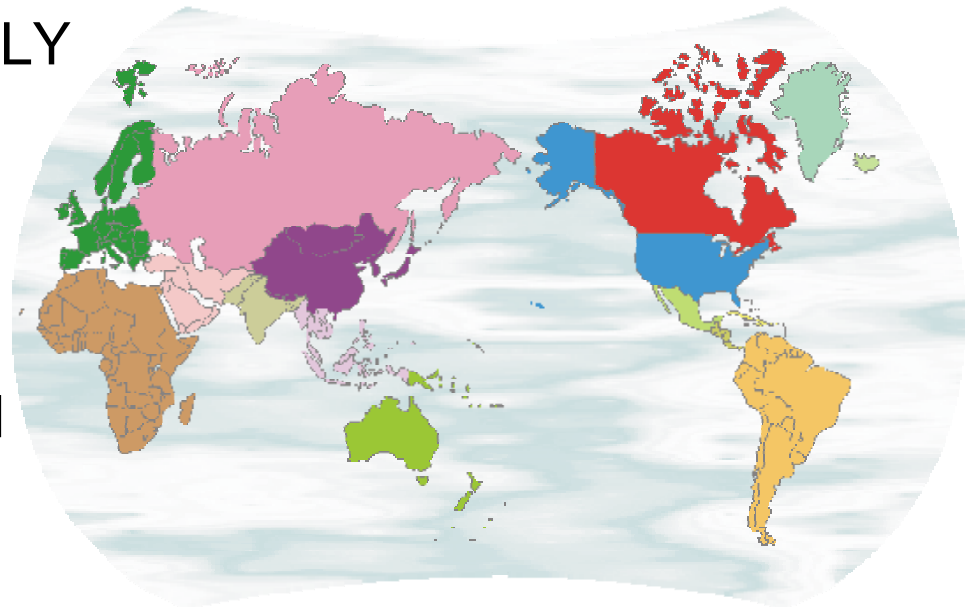
Georgetown, Penang in 1814. As a free port Penang was enjoying unrivalled commercial success at this time.



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- PENINSULAR + SABAH & SARAWAK
- EQUATORIAL CLIMATE –DAILY TEMP 24.5-33.7 Celcius
- RAINFALL 2775mm
- HUMIDITY 79.8 %
- SIZE 330,252 SQ KM
- FAST DEVELOPING NATION



BASIC STATISTIC

- POPULATION 25.6MILLION (growth rate 2.6%pa)
- URBAN POPULATION 62.8% (2004)
- DENSITY 79 PERSONS/SQ KM
- 0-15YRS COHORT – 32.9%
- HOUSEHOLD SIZE 4.5 PERSONS
- MAJOR INDUSTRIES – MANUFACTURING(E &E, TEXTILE), OIL & PETROLUEM, PALM OIL .
- REAL GDP 5.2% (03) , 6.2%(2004) INFLATION : 1.5%
- PER CAPITA US\$4046/PPP= US\$10, 124
- VEHICULAR OWNERSHIP 2.5 /HH



Scenarios 2050

Scenario A (2050)

- Population 98million
- High economy growth rate at 5-6% p.a.
- Heavy Industry and transport will continue to grow and propel the nation forward
- Biomass/ biofuel/ hydro
- High efficient fossil fuel technologies CCS

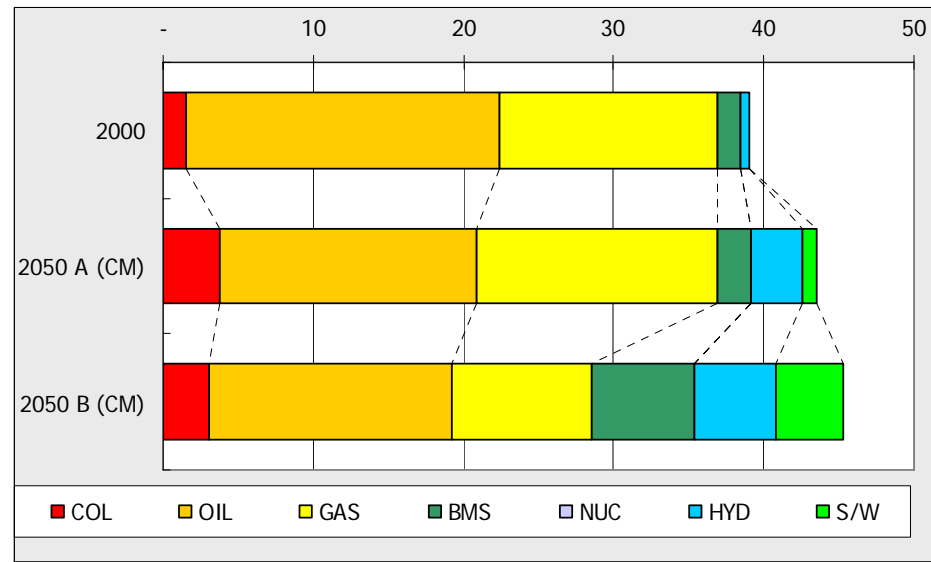
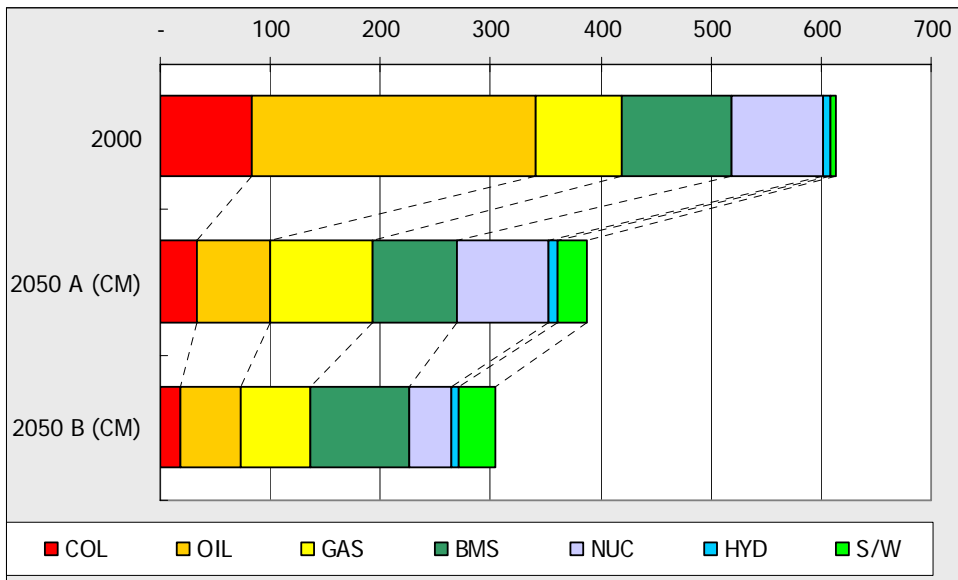
Common features

- Developed nation status by 2020
- Leap frog with IT and Hi- tech/ cyber cities Energy efficient production technology

Scenario B (2050)

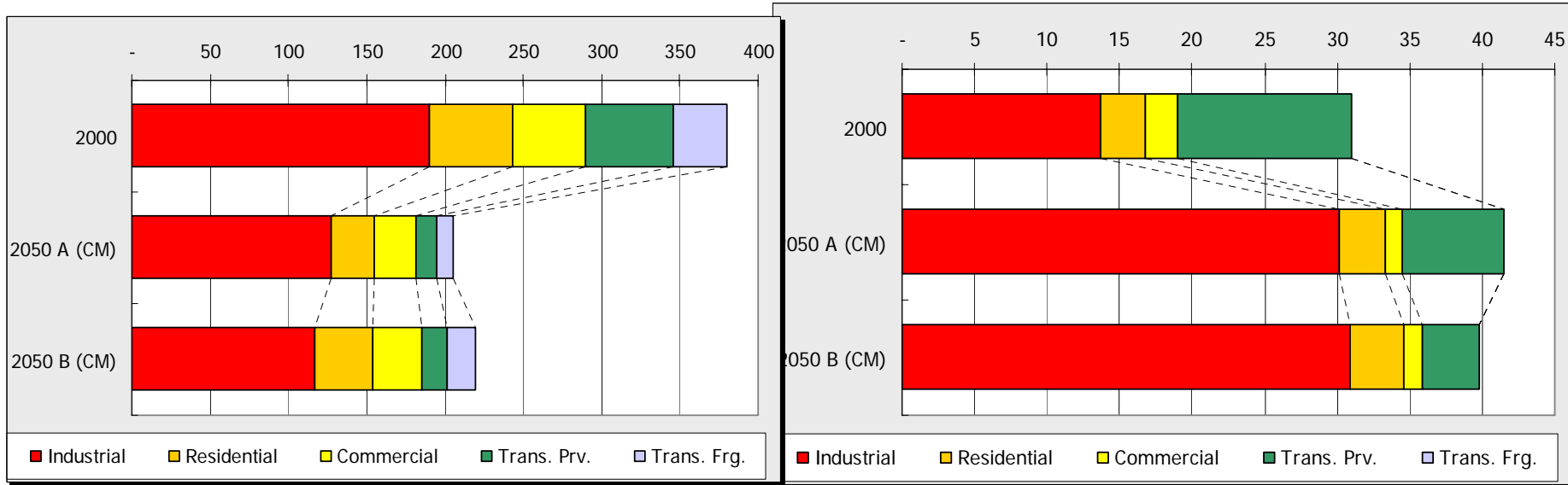
- Population 63 million
- Medium economic growth rate at 4-5% p.a.
- Industry, bio tech and hi tech development- MSC corridor and cyber cities
- Renewable energy- solar/wind/ H2
- Compact cities & green corridor

Primary Energy Consumption



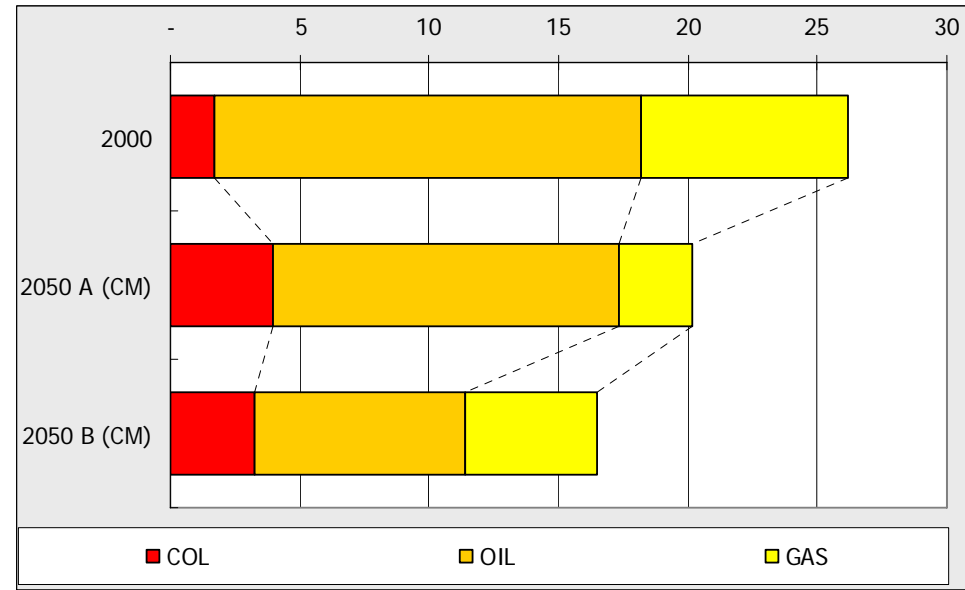
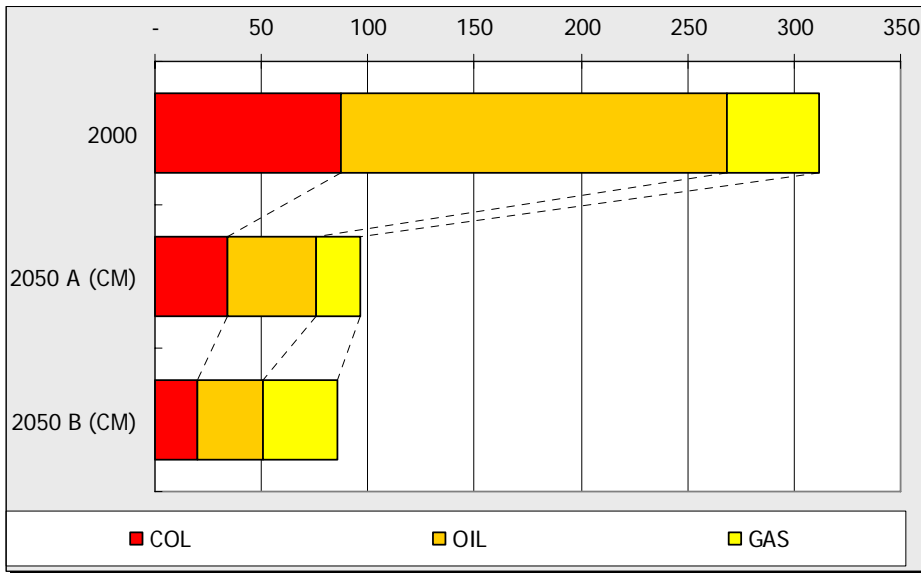
- Malaysia consumption increases due to rapid growth
- Scenario A – depend on fossil fuel & introduce hydro and biomass
- Scenario B – marked increase in biomass, hydro and renewable energy.

Secondary Energy consumption



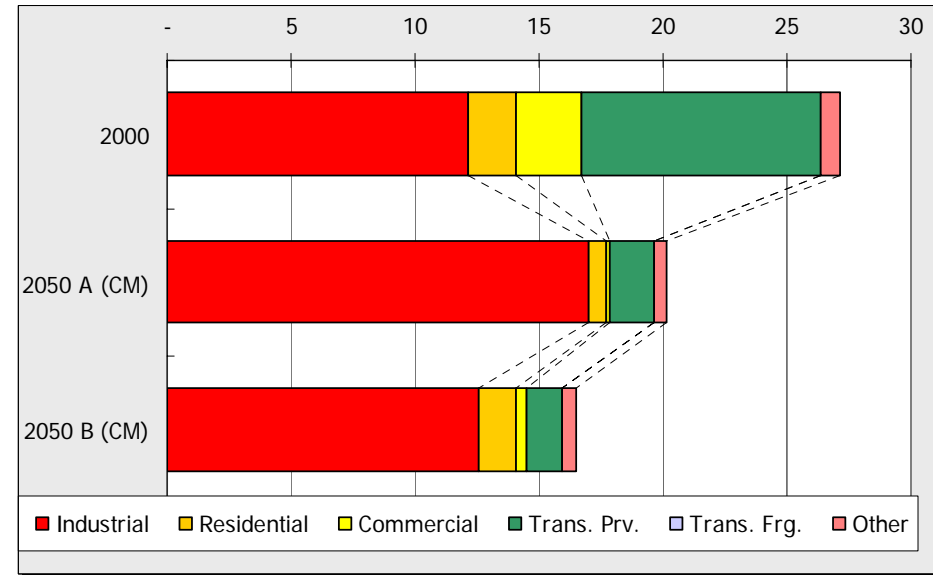
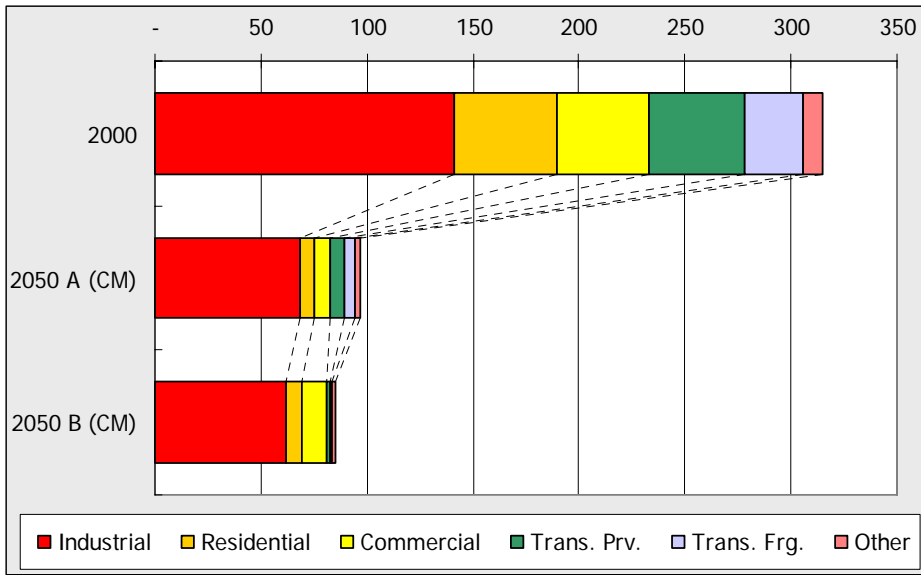
- Relatively high growth in industrial sector, followed by transport and housing.
- Energy consumed by Transport sector fall significantly in both scenarios.

CO2 Emission by Fuel



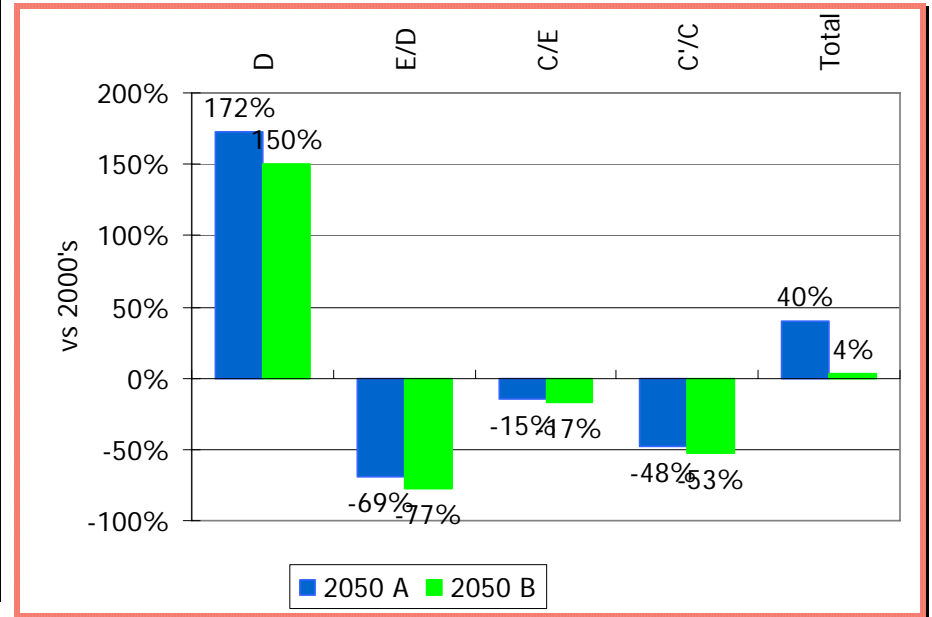
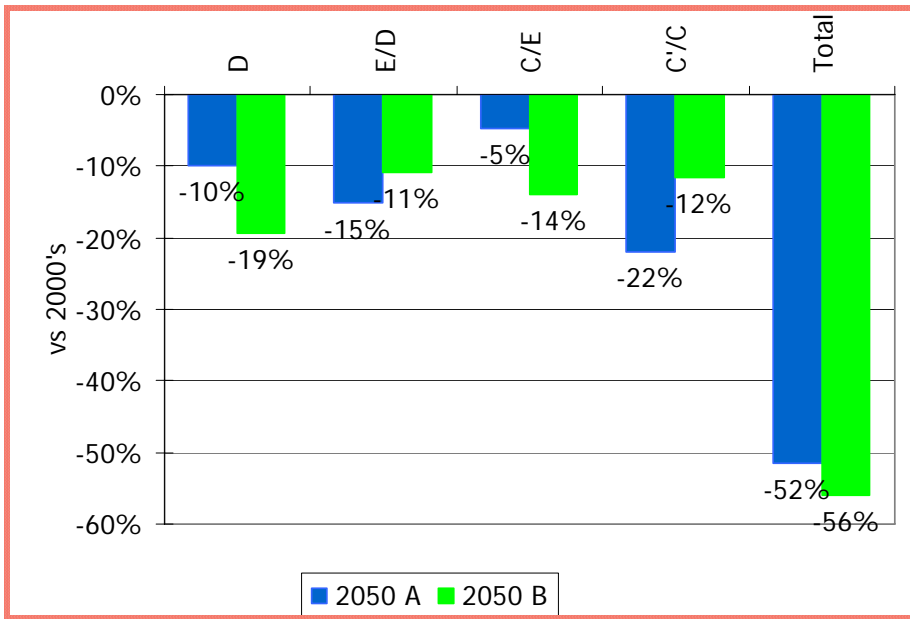
- Slight reduction of CO2 emission by fuel as compared with the case of Japan
- CO2 emission from Oil is still predominant in the 2050

CO2 Emission by Sector



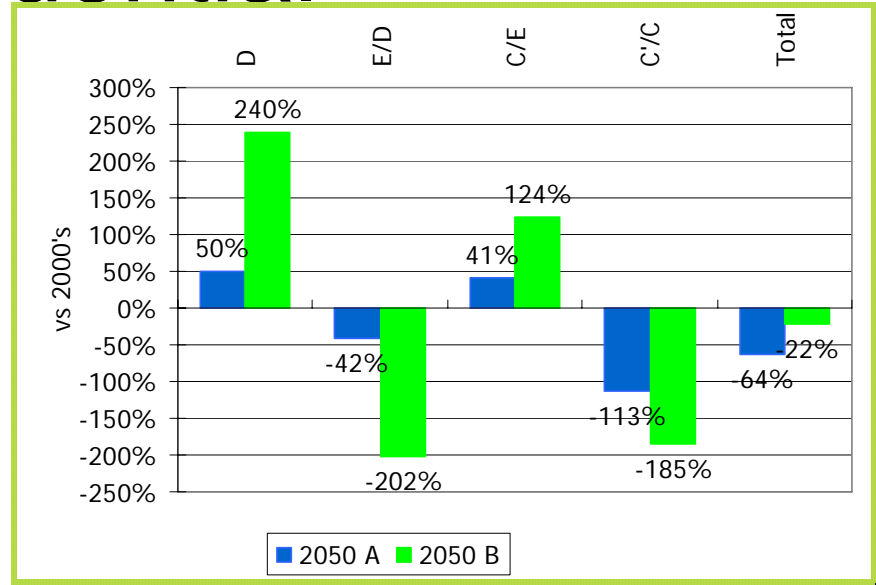
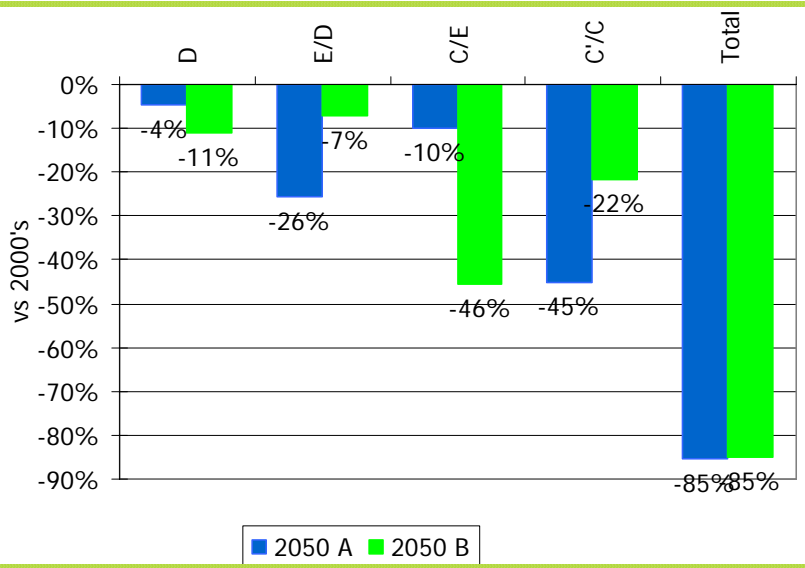
- Industry sector is the main contributor of Co2 emission followed by transport.
- Scenario 2 – residential sector in medium density and new construction garden city living

Industrial sectors



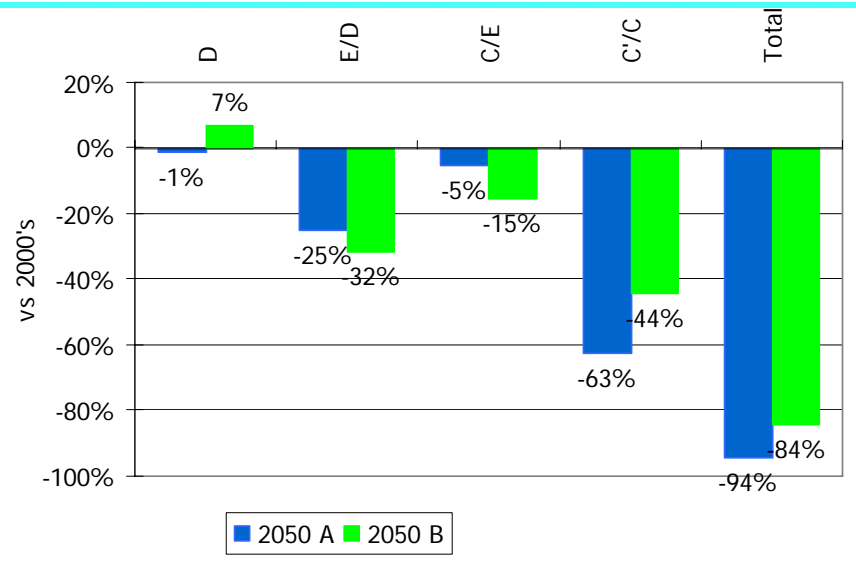
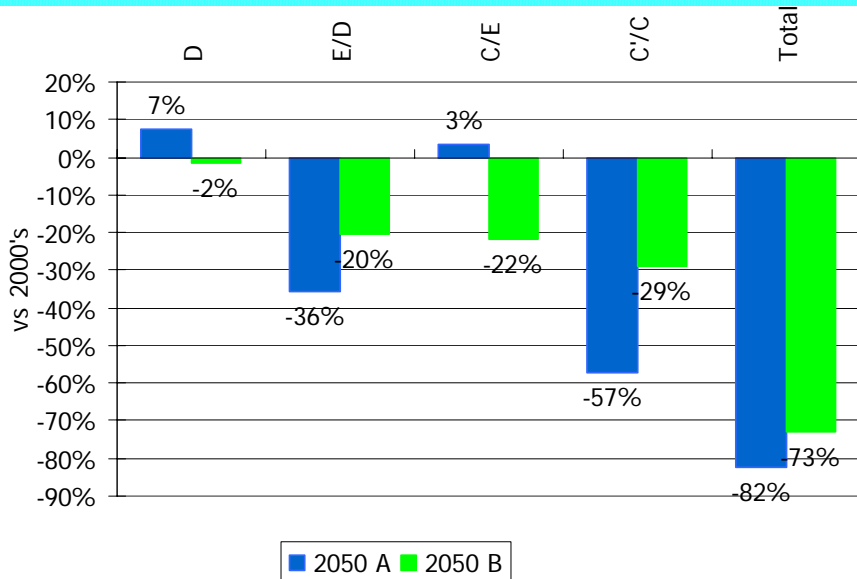
- Malaysia shows a relative high Demand contributed by economic growth in mfg and IT sector hence contributed to overall increase in CO2 emission.

Residential



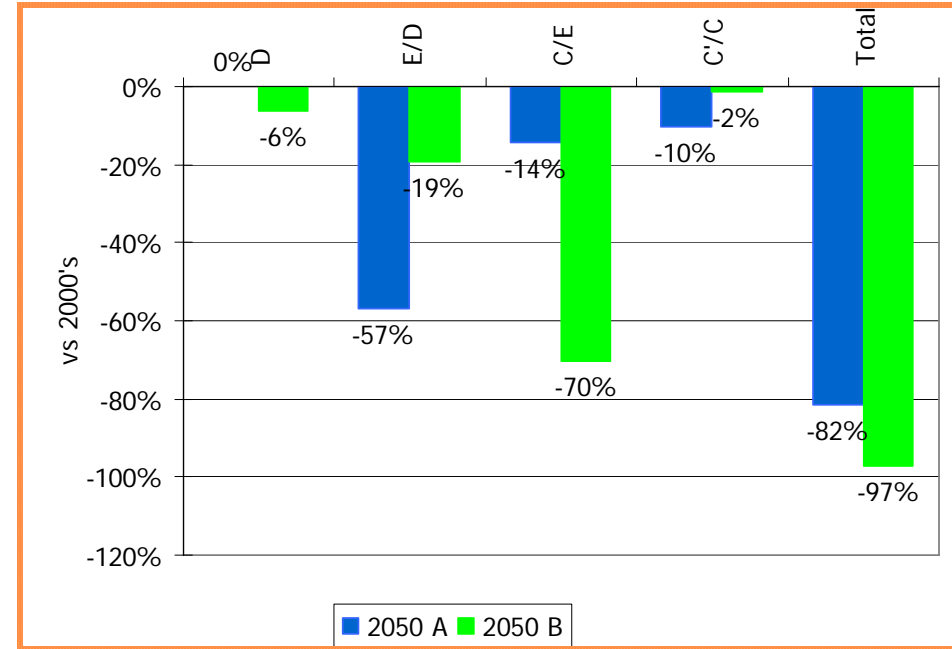
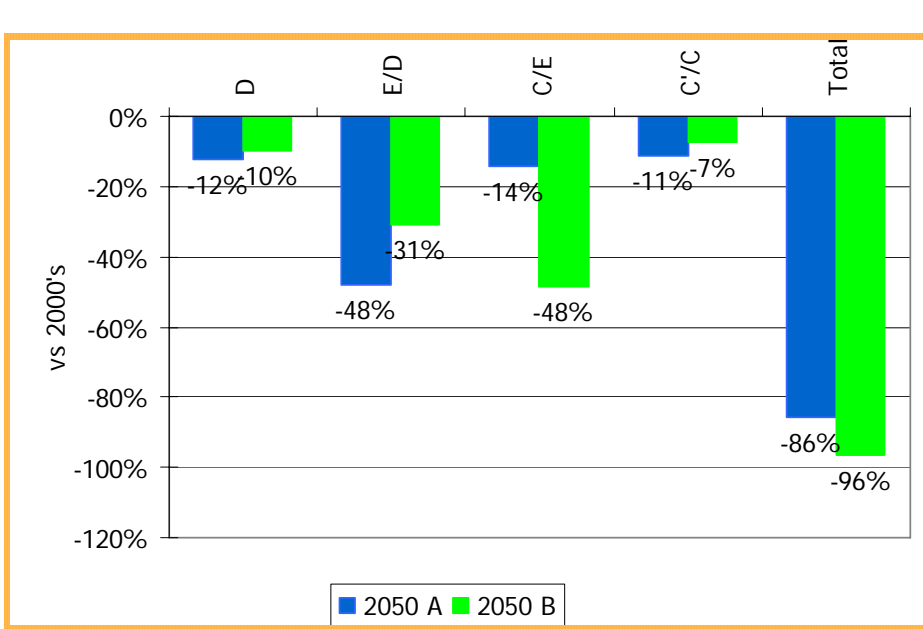
- Factor analysis of CO₂ emission shows small reduction in Malaysia as compared with Japan.
- However in the case of Malaysia Demand is high due to relative high positive economic growth and population.
- Positive C'/E (Co₂ without counter measures).
- Scenario B shows a high reduction in E/D (energy intensity) and change in CO₂ intensity (C/C') resulting from countermeasures in transformation

Commercial



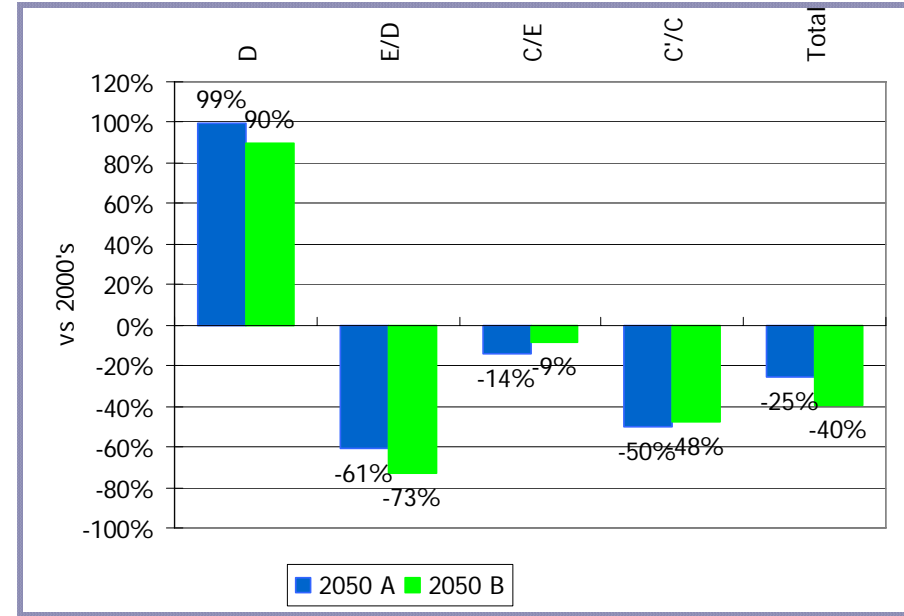
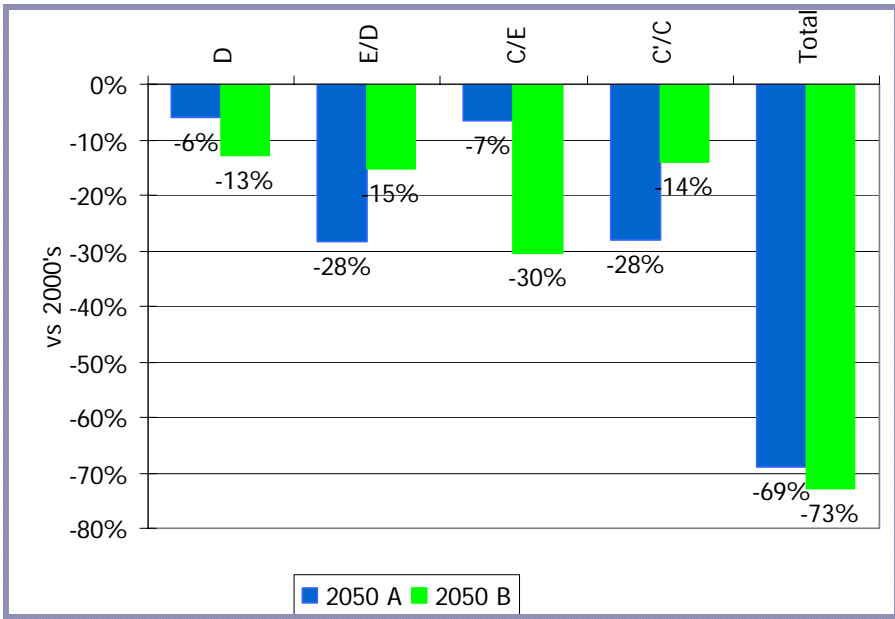
- Commercial sector has quite similar pattern with Japan. Globalisation in retail and shopping pattern. Reduction in CO2 emission are observe din both cases.

Transport



- Transport sector experiences a sharp fall in CO2 emission in both cases. The imported advanced technology in hybrid vehicles, H2 fuel and widely use of bio-fuel in Malaysia contributed to this reduction

Overall scenario C02 emission



Malaysia has a positive figure in demand drive due to continuing population growth and economic growth.

Both cases show a reduction in Co2 emission in both scenarios A and B.

Conclusion

- Low Carbon society in developing country like MALAYSIA with small population and rich in resources is attainable with planned driving forces to reduce CO2 emission.
- This involves changes in
 - DEMAND (SD - Service demand) and EE(Energy efficiency) and
 - SUPPLY (CI - Carbon intensity reduction and CCS)

Among possible options are

- Society – activity 5Rs
- Industry – EE and CI (fuel cell/ bio fuel)
- Residential – EE and CI (PV/ fuel cell)
- Transportation- SD (public transport), EE and CI(fuel cell/ bio fuel)
- Energy supply – CCS and CI