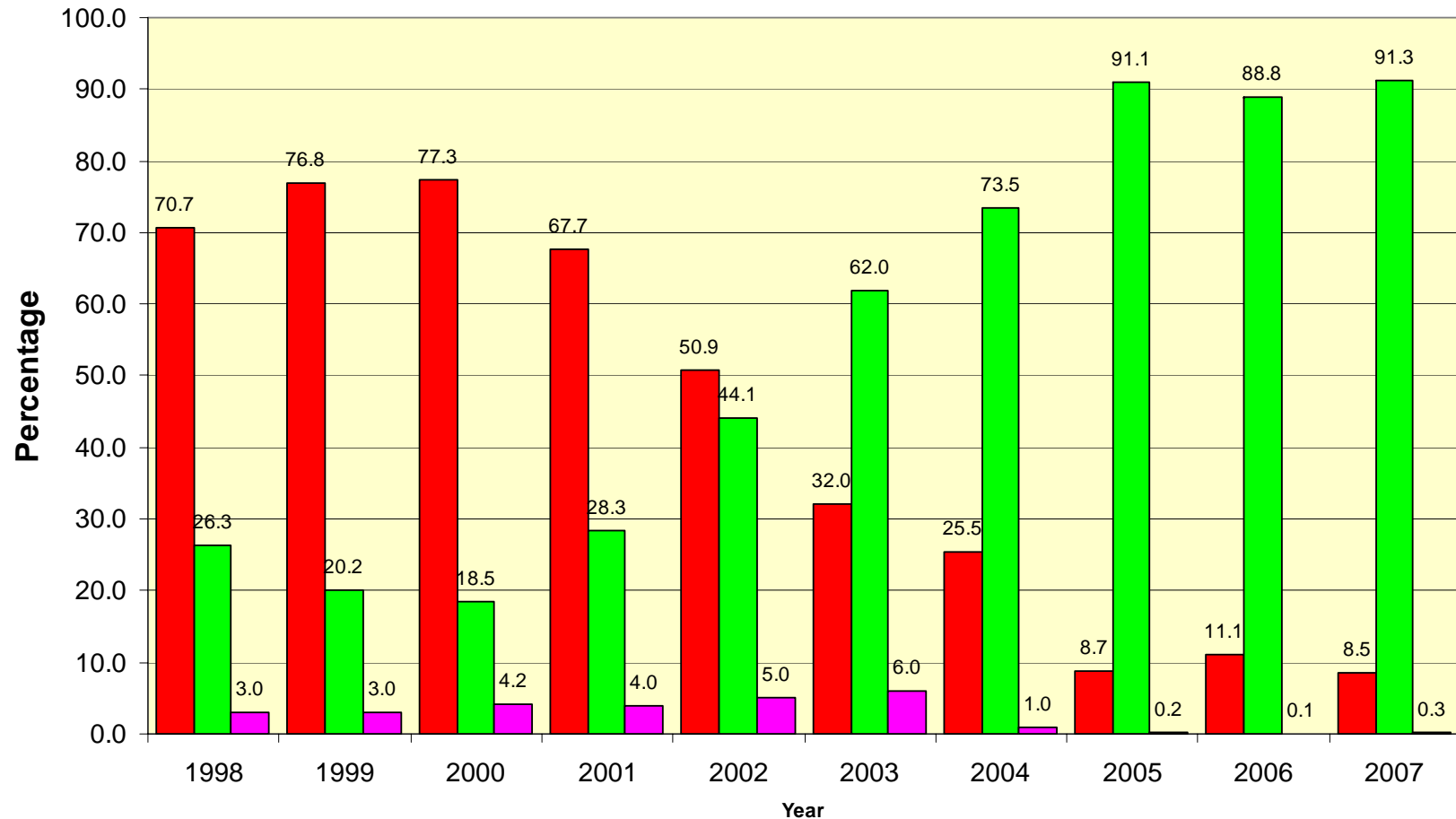


# Senoko Electricity Generation by Fuel Type

## Generation Fuel Mix



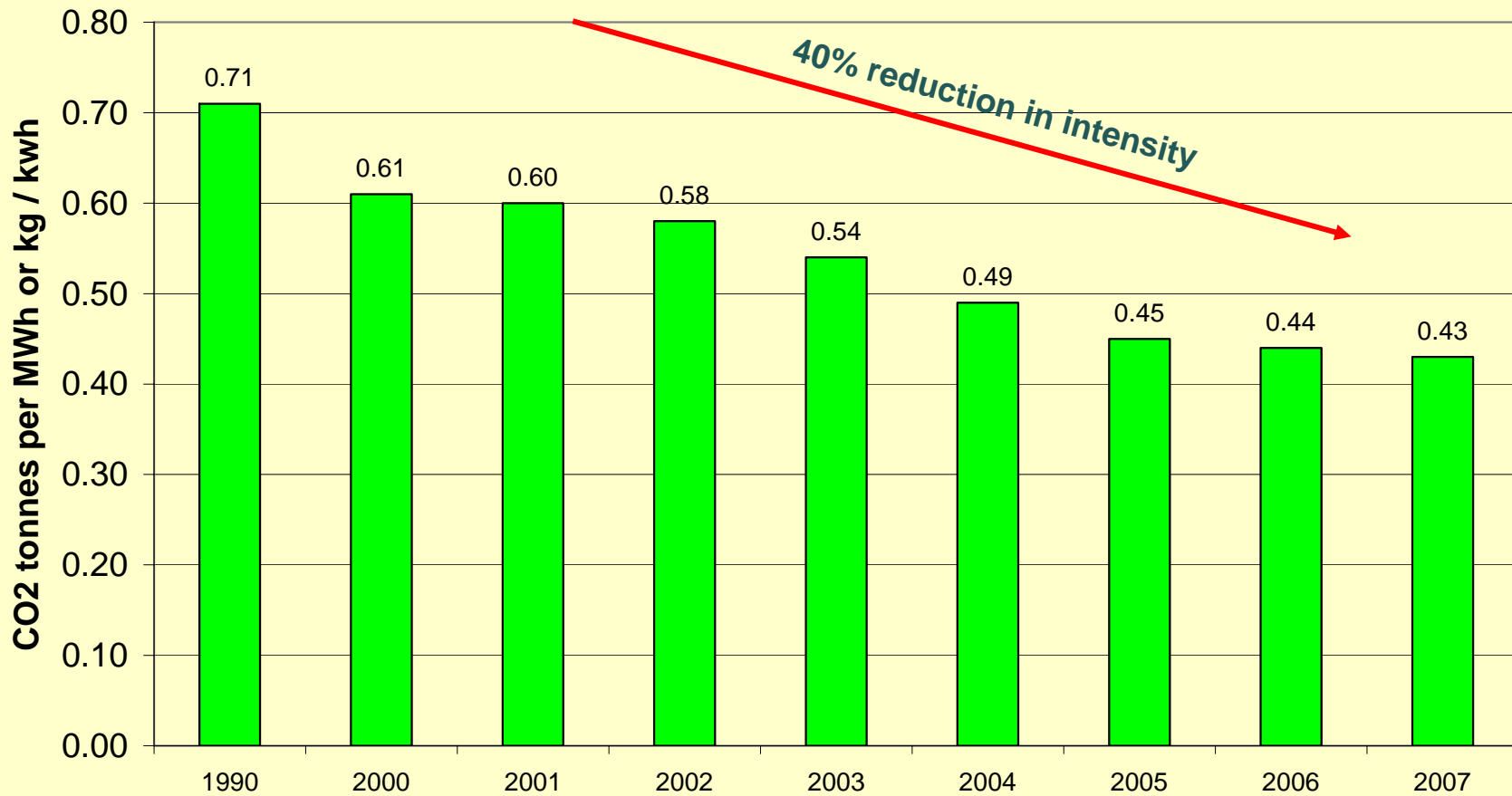
Fuel oil Natural gas Diesel



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# Reduction in emission intensity better than national average

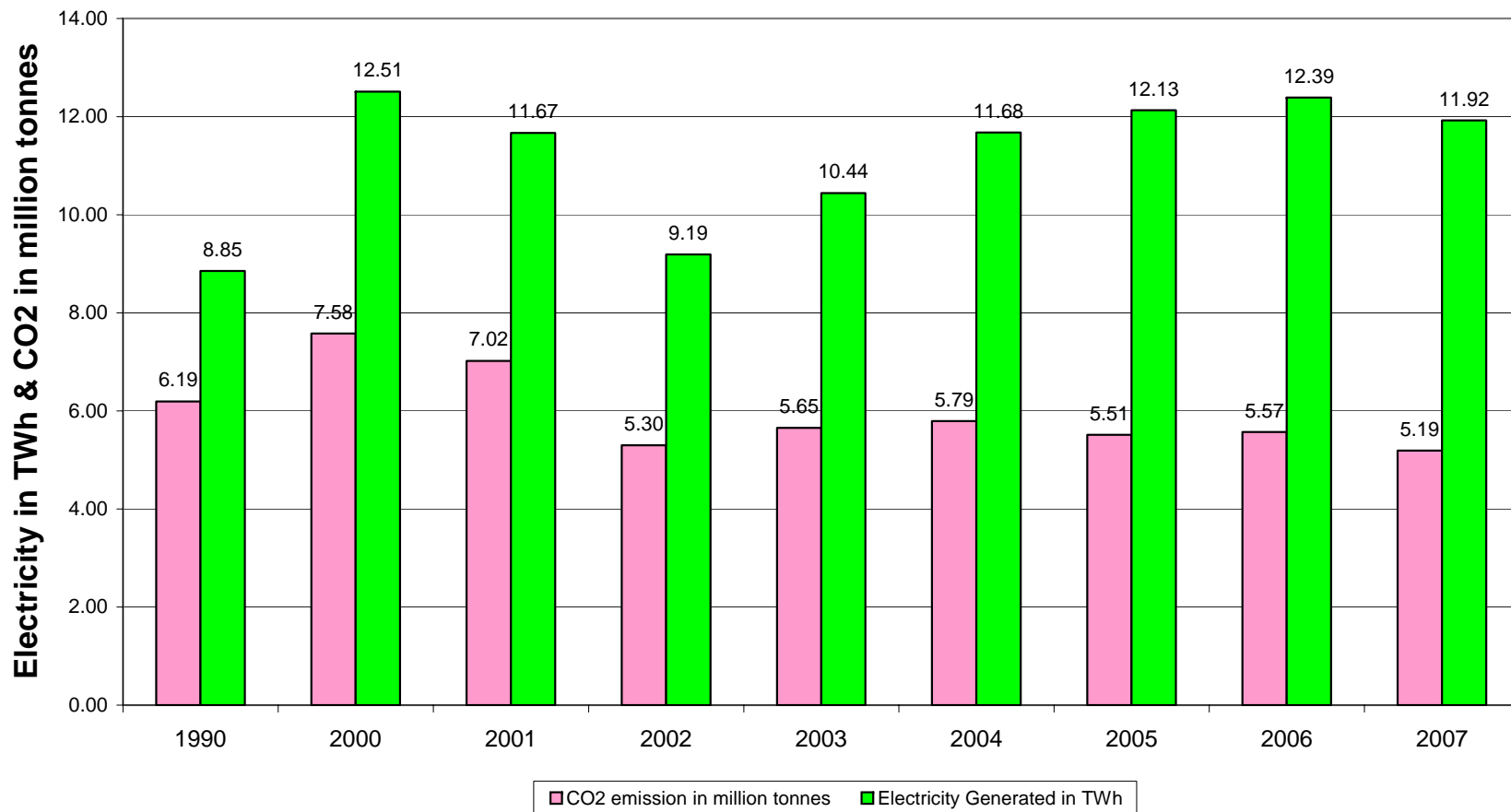
## Senoko Carbon Emission Intensity



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# CO<sub>2</sub> production is still lower than in 1990

## Annual Electricity Production & CO<sub>2</sub> Emission at Senoko Power



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CARMA.org (<http://www.carma.org/>)



- Power generation accounts for 48% of all carbon emissions in Singapore, 40% in USA and about one-quarter of global emissions.
- Carbon Monitoring for Action (CARMA.org) is a massive database containing information on carbon emissions of >50,000 power plants and 4,000 power companies worldwide. It is produced and financed by the Centre for Global Development, an independent and non-partisan think-tank located in Washington DC of USA. CARMA.org is the **first global inventory of a major, emissions-producing sector of the economy**.
- CARMA draws its information from mandatory submissions to the Environment Protection Agency (EPA) by US utilities, official emission reports from Canada/ European Union/OECD/India, and, using statistical model calculator based on plant-level engineering and fuel specifications for power plants from the rest of the world.
- The objective of CARMA.org is to arm individuals with the information they need to forge a cleaner, low-carbon future. By revealing the unvarnished truth regarding both clean and dirty power producers, CARMA hopes to influence the opinions and decisions of consumers, investors, shareholders, managers, workers, activists, and policymakers.



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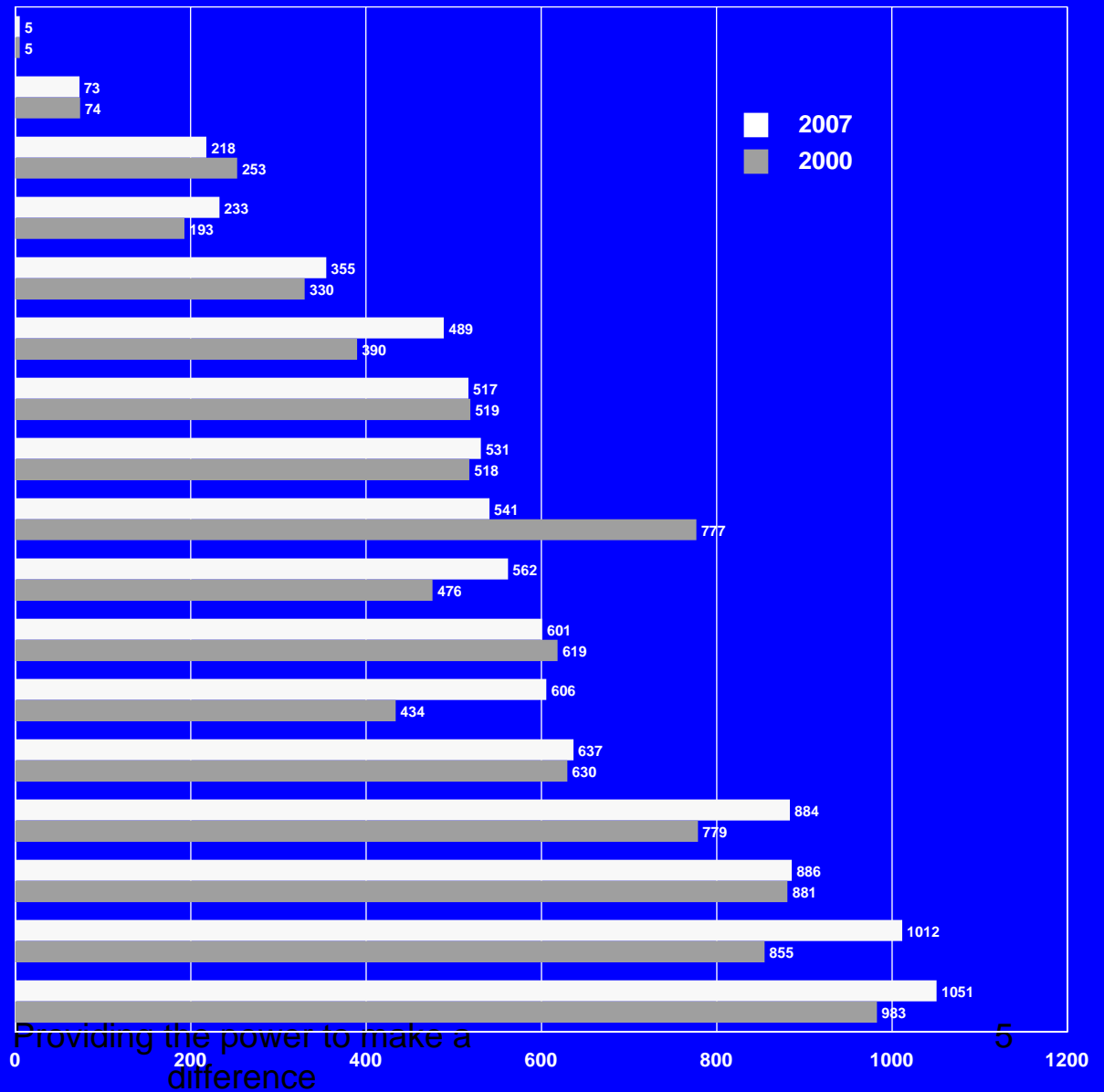
## Legends in CARMA website, <http://www.carma.org/>

- CO<sub>2</sub> emission intensity colour codes range from **red** to **green**
  - > 1,750 lb/MWh = > 794 kg/MWh (coal)
  - 1,250~1,750 lb/MWh = 567~794 kg/MWh (oil)
  - 750~1,250 lb/MWh = 340~567 kg/MWh (natural gas)
  - 250~750 lb/MWh = 113~340 kg/MWh
  - < 250 lb/MWh = < 113 kg/MWh (nuclear, hydro)
- Original CARMA database of CO<sub>2</sub> is expressed in US ton and lb/MWh
  - 1 ton (short, US) = 2,000 lbs
  - 1 lb = 0.453592 kg
  - 1 TWh = 1,000,000 MWh = 1x10<sup>12</sup> KWh

# Carbon Dioxide Generated in kg/MWh in Year 2000 and Year 2007

Source: Data from CARMA (www.carma.org)

CO <sub>2</sub> mm tonnes	Electricity TWh	
0.27	55.80	● Switzerland
41.54	565.00	● France
130.61	598.00	● Canada
9.61	41.30	● New Zealand
362.80	1,020.00	● Japan
0.53	1.07	● Macau
322.89	625.00	● Germany
192.28	362.00	● United Kingdom
18.68	34.60	● Singapore
167.80	299.00	● South Korea
138.77	231.00	● Taiwan
599.53	989.00	● Russia
2,530.53	3,970.00	● United States
55.15	62.50	● Hong Kong
528.78	597.00	● India
2,430.76	2,410.00	● China
204.98	195.00	● Australia



Dirty ● ● ● ● Clean

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# Carbon Dioxide Generated in kg/MWh in Year 2000 and Year 2007

Source: Data from CARMA (www.carma.org)

CO<sub>2</sub> million tonnes/MWh  
Electricity TWh

0.80

1.68

● SEMBCORP SAKRA



4.96

10.30

● SENOKO

5.35

9.68

● TUAS

6.34

10.60

● PULAU SERAYA

Dirty ● ● ● ● ● Clean

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