Linkage of greenhouse gas inventory to mitigation options

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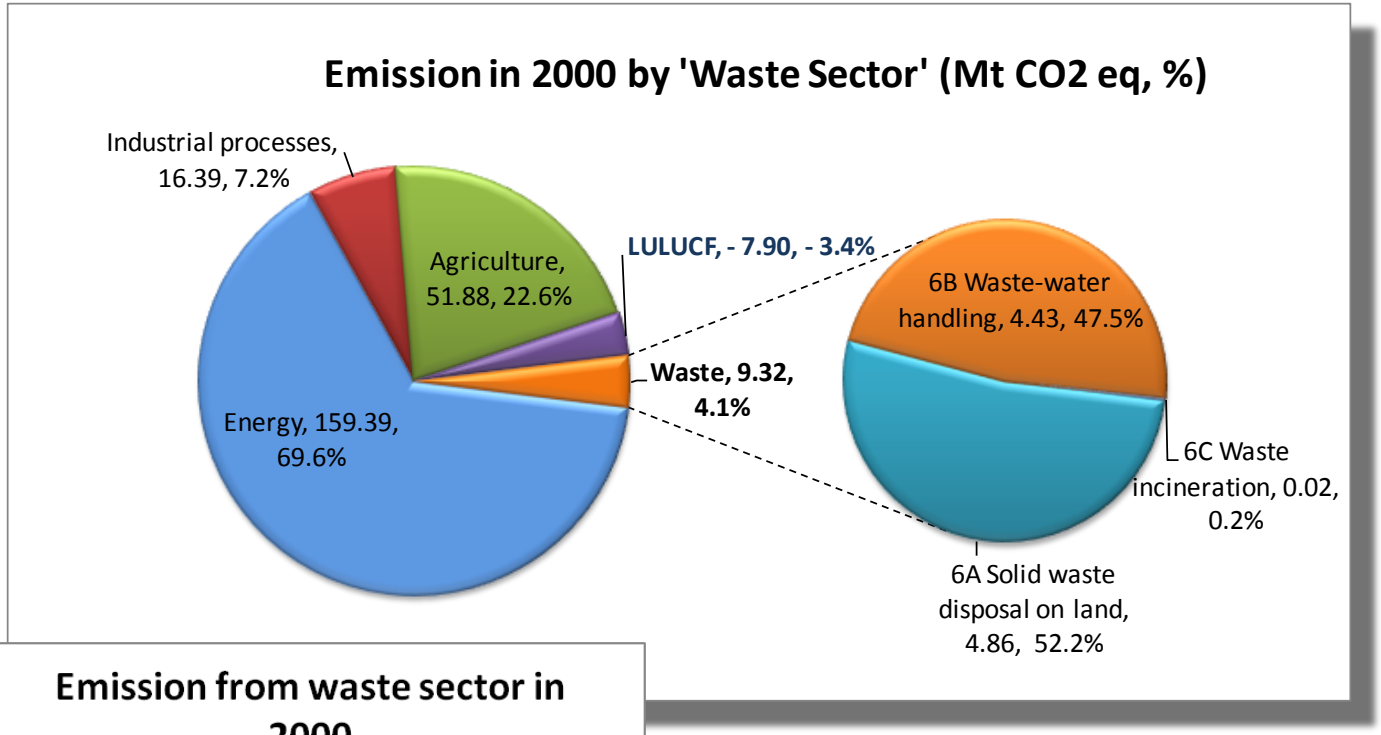
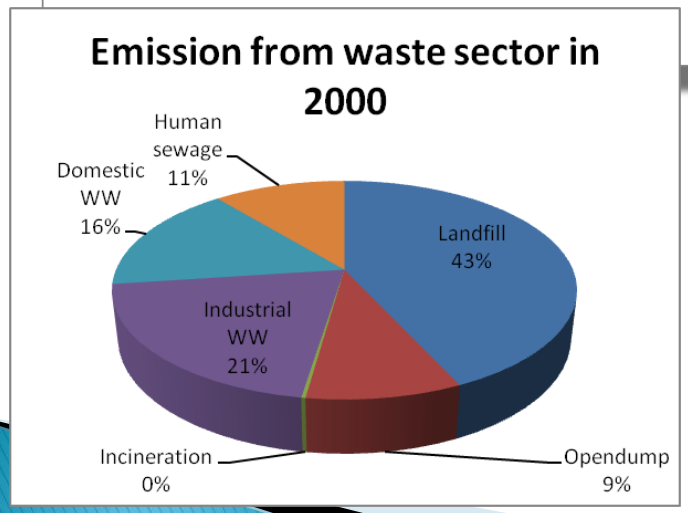
Thai NGHGI : Waste sector

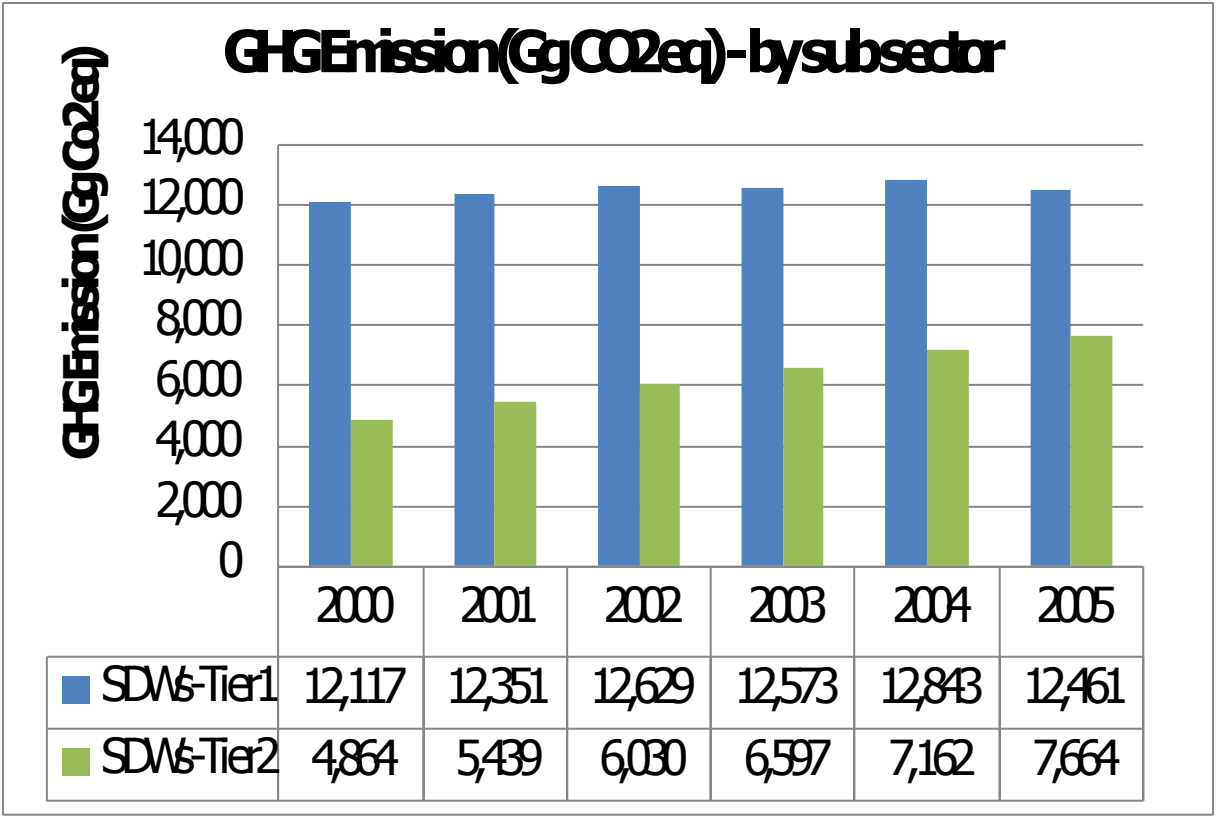


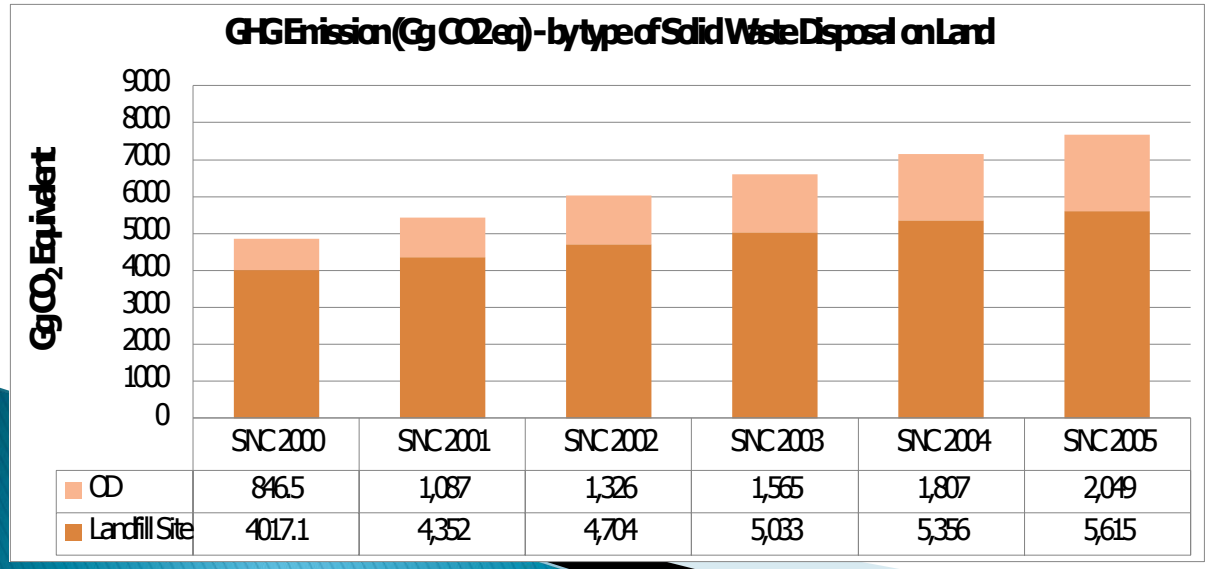


(Tier 1)	Emission Factor
MCF	**Waste Disposal Method** / **MCF** Landfill 1.0 Open dumpsite-deep (d ≥ 5m) 0.8 Open dumpsite-shallow (d < 5m) 0.4
DOC and DOC_F	0.14 and 0.77
F	0.53
R	0
OX	OD: 0, LF: 0.17

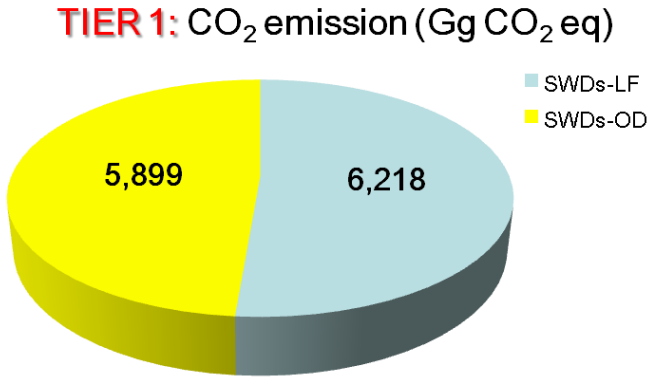
6A solid waste disposal on land (Tier 2)

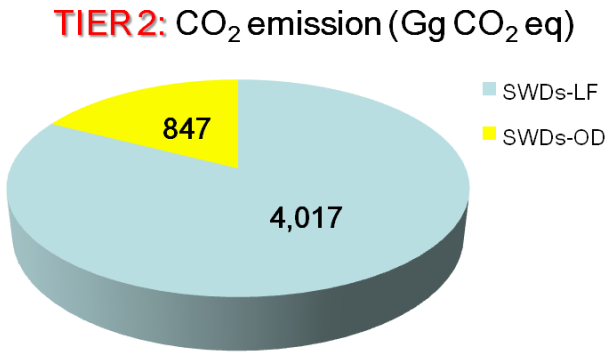
Emission Factor		Defaults 1996 IPCC		SNC (2000-2005)	INC (1994)
L_o, m^3/Mg of refuse	Wet climate	180-200	Metro. LF	121.40	121.40
	Medium moist. climate	160-189	LF	130.22	103.7
	Dry climate	140-160	OD	70.42	60.7
k, 1/yr	LF	0.003-0.40	LF	0.07	0.04
	OD		OD	0.03	0.03





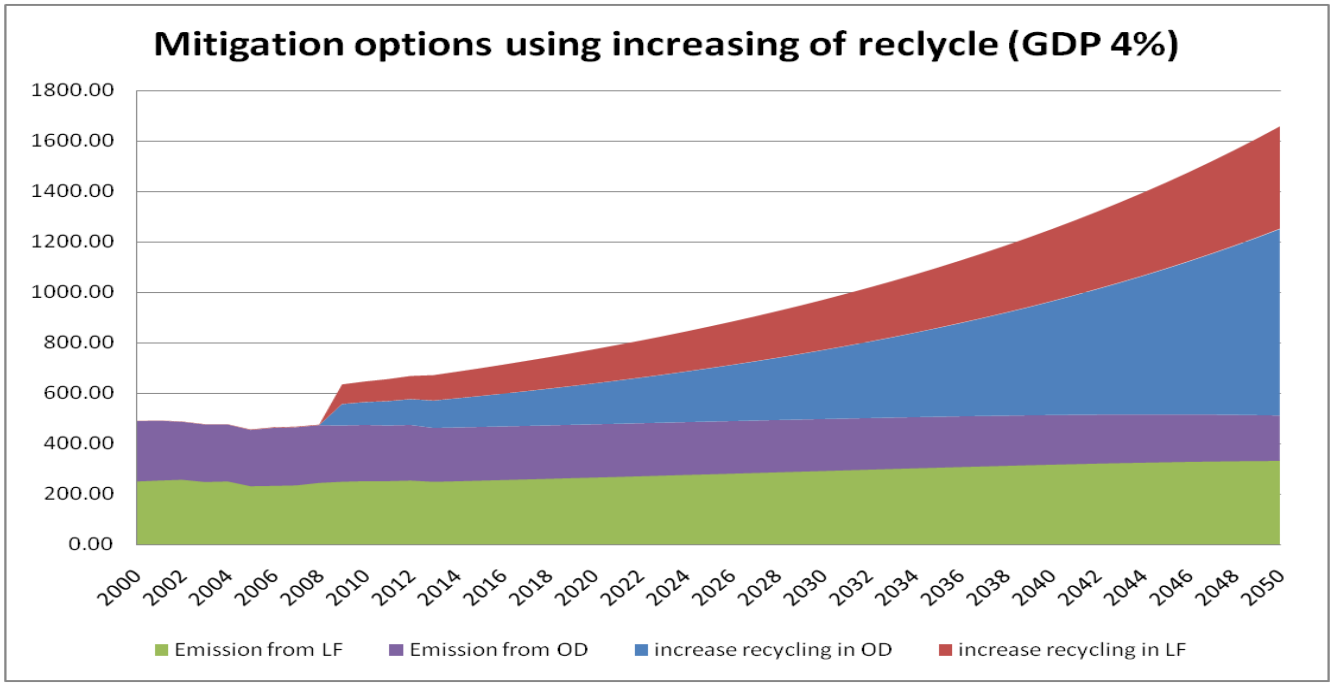
Comparison of Tier 1 and Tie

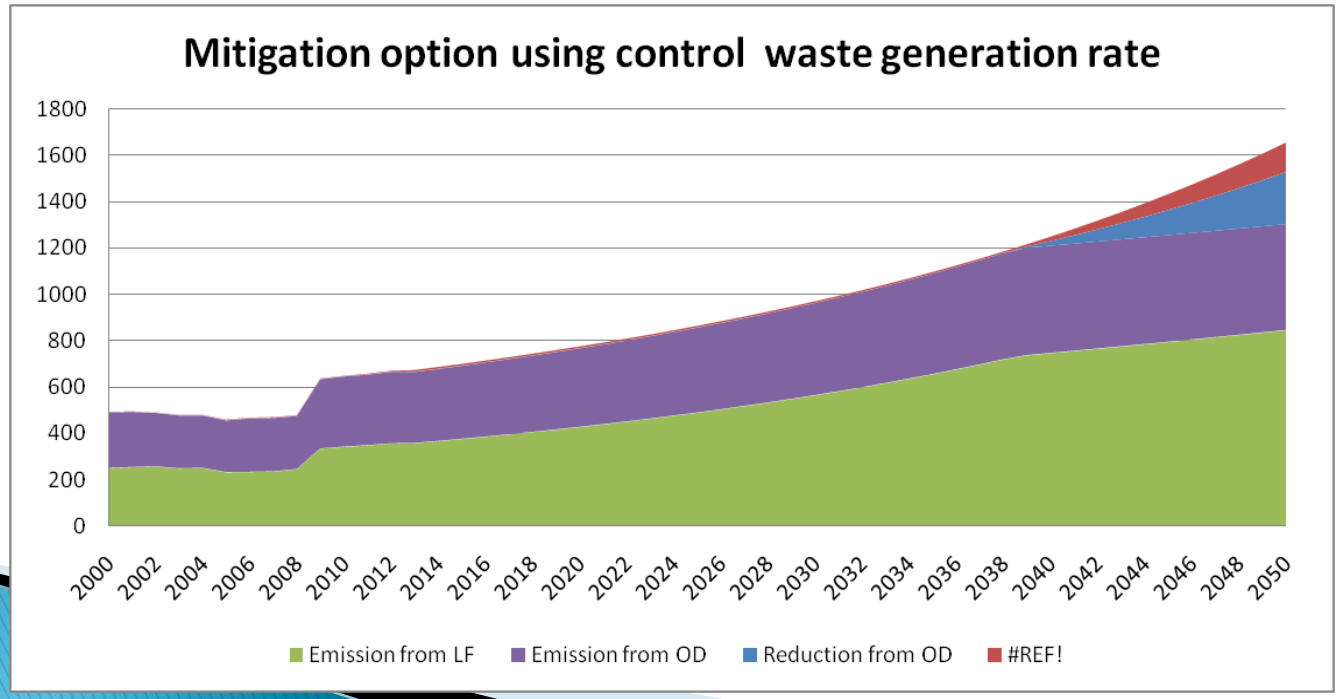




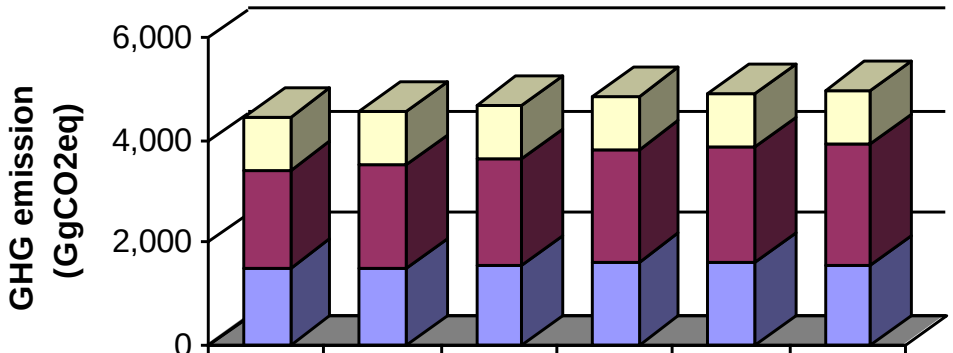
Difficulty in data collection

- Two mitigation options-Policy driven
- Increasing recycle rate and control waste generation rate
- Difficult to estimate by sites
- K value may be different due to waste composition change
- Tier 1 using fraction of waste to landfill

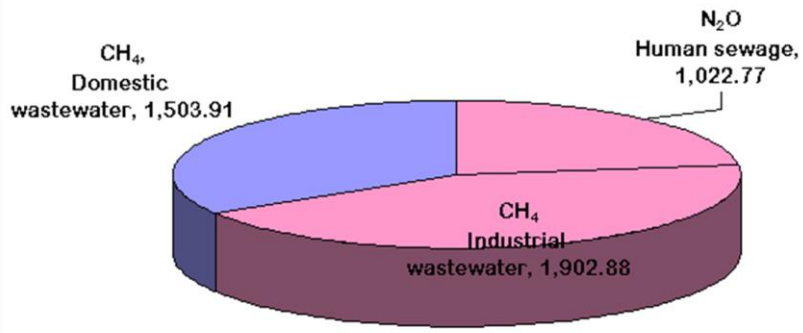

Mitigation options using increasing of reclycle (GDP 4%)
1800.00
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044 2046 2048 2050
Emission from LF
Emission from OD
increase recycling in OD
increase recycling in LF


Mitigation option using control waste generation rate
1800
1600
1400
1200
1000
800
600
400
200
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044 2046 2048 2050
Emission from LF
Emission from OD
Reduction from OD
#REF!

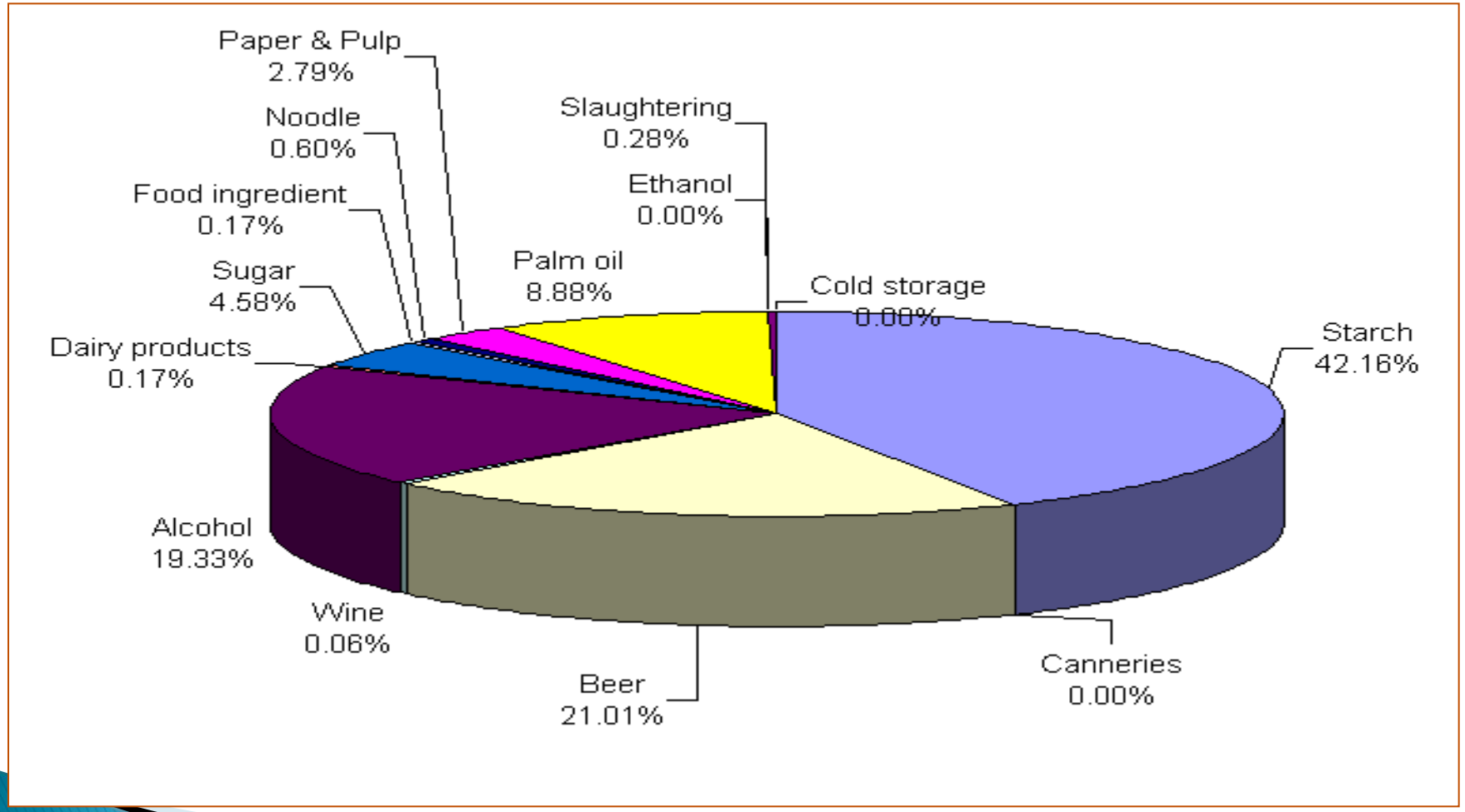
Wastewater handling



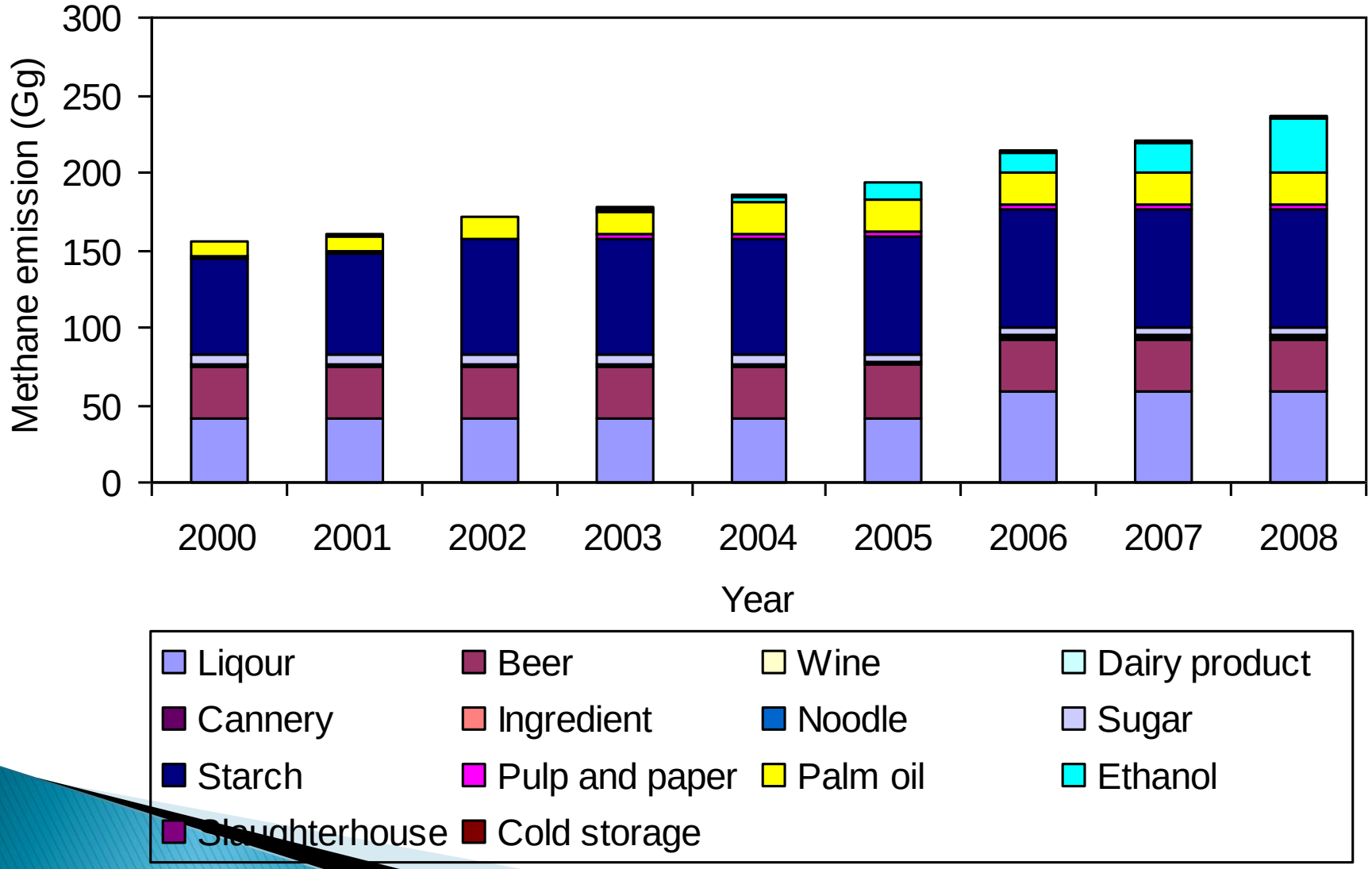
	2000	2001	2002	2003	2004	2005
Human sew age	1,022	1,029	1,038	1,042	1,024	1,031
Industrial w astew ater	1,902	1,996	2,095	2,221	2,265	2,342
Domestic w astew ater	1,504	1,517	1,549	1,602	1,603	1,579



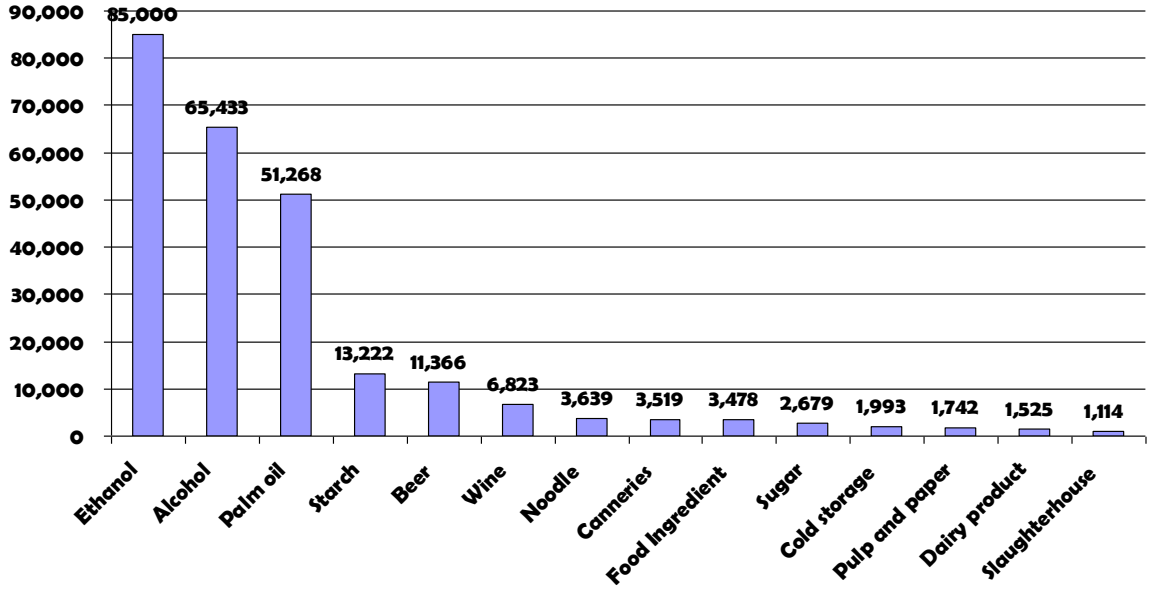
CH_4 emission by types of industry :2000

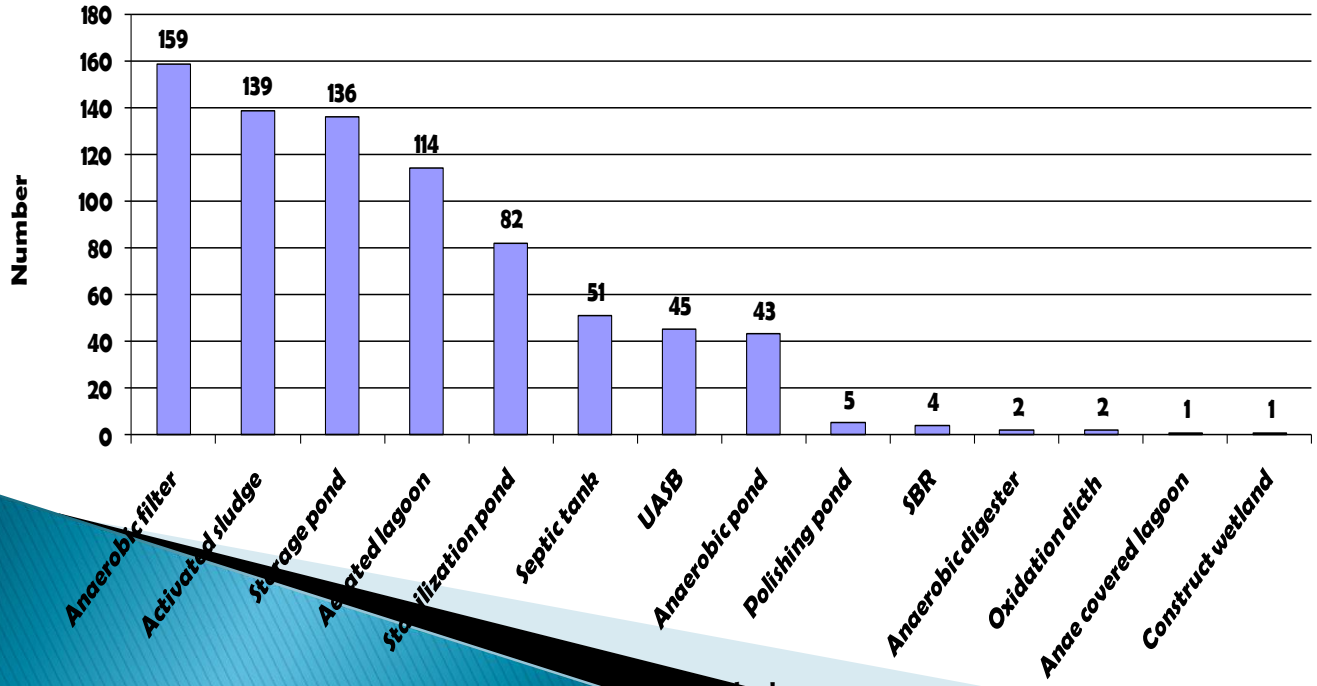


Methane emissions from industrial wastewater for 2000-2008



Average COD (mg/l) from each industrial sector





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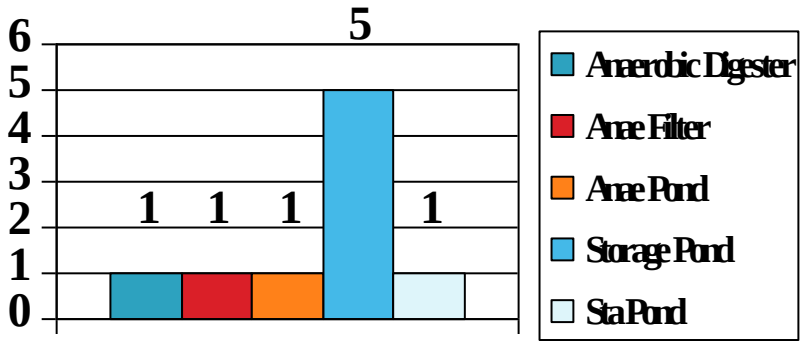
MCF for industrial wastewater

Type of treatment and discharge pathway	Used MCF value
Anaerobic covered lagoon	0.74±0.12
Upflow anaerobic sludge blanket (UASB)	0.81±0.08
Anaerobic filter	0.76±0.10
Anaerobic tank	0.72±0.11
Anaerobic pond	0.56±0.18
Anaerobic digester	0.76±0.10
Septic tank	0.58±0.19
Stabilization pond	0.33±0.17
Polishing pond	0.15±0.17
Aerated lagoon	0.09±0.09
Activated sludge	0.05±0.06
Constructed wetland	0.17±0.12
Oxidation ditch	0.14±0.12
Sequencing batch reactor	0.12±0.14
Storage pond	0.23±0.14

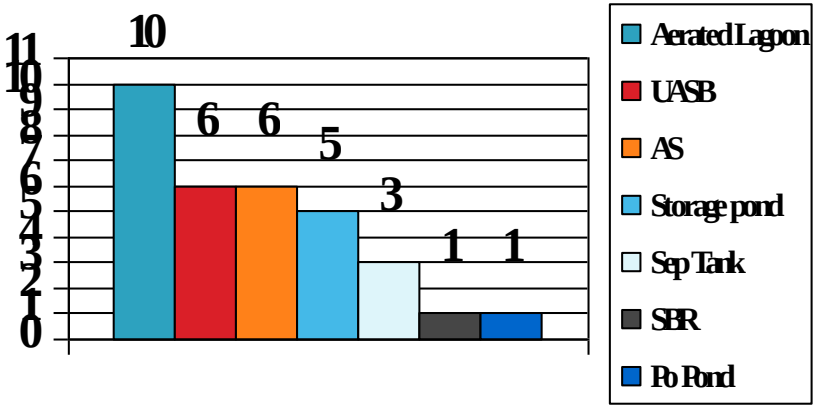
Expert Judgment Method

Technologies used in some industrial sector

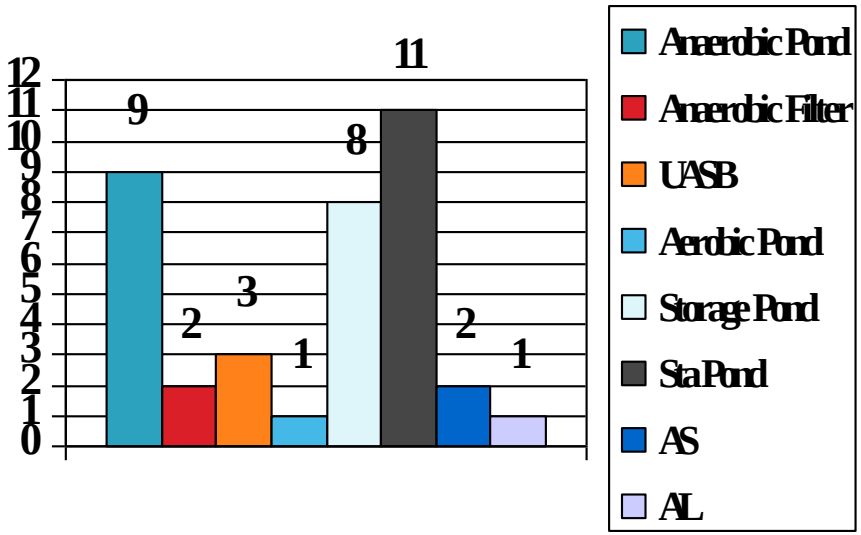
Ethanol



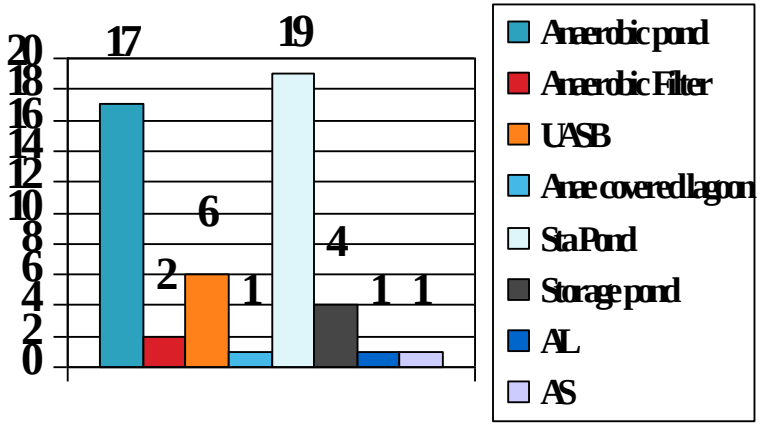
Liquor



Palm Oil



Starch



Conclusion

- Time series of inventory can be input to common emission projection in the future
- Mitigation options can base on policy driven and technology driven
- Disaggregate data for Tier 2 although can lead to more accuracy emission estimation but have some limitation in projection, particularly when introduction policy driven option where some specific parameter can not be achieved
- Technology driven option can be more specific to inventory with disaggregate data

Thank you