

Supplementary Material

Table S1. WHO air quality guidelines and interim targets for particulate matter: annual mean concentrations ($\mu\text{g}/\text{m}^3$).

	Guidelines	Air quality guideline(AQG)	Interim target 3	Interim target 2	Interim target 1
PM ₁₀	24-hours mean	50	75	100	150
	1 Year mean	20	30	50	70
PM _{2.5}	24-hours mean	25	37.5	50	75
	1 Year mean	10	15	25	35

AQG: These are the lowest levels at which total, cardiopulmonary and lung cancer mortality have been shown to increase with more than 95% confidence in response to long-term exposure to PM_{2.5}

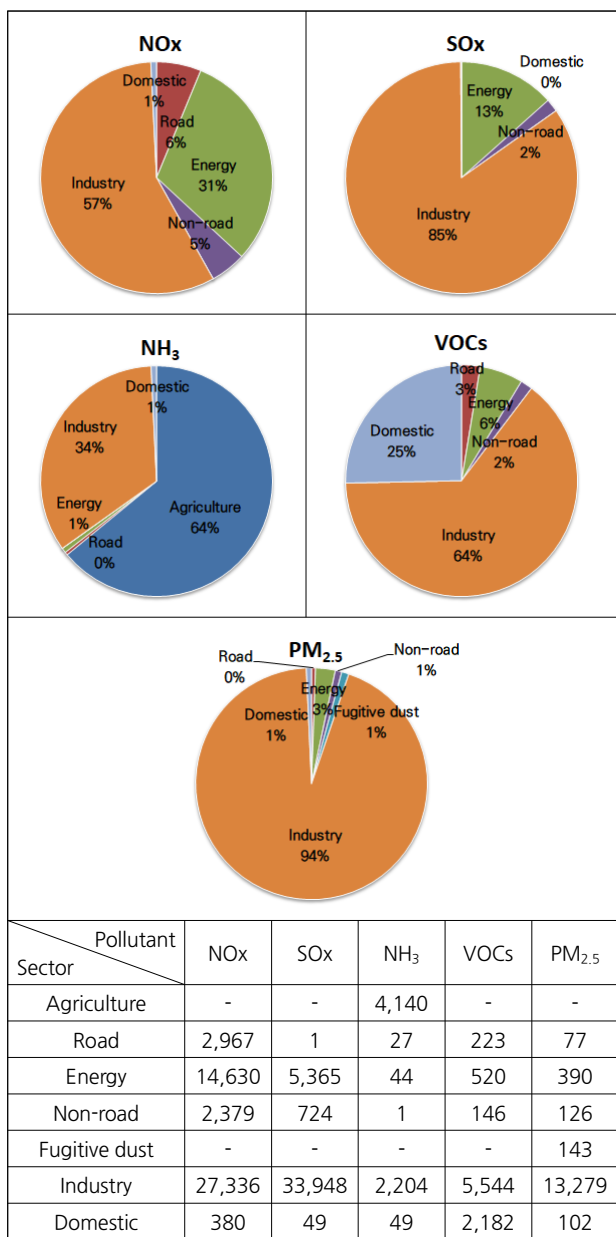
Interim target-1 (IT-1): These levels are associated with about a 15% higher long-term mortality risk relative to the AQG level.

Interim target-2 (IT-2): In addition to other health benefits, these levels lower the risk of premature mortality by approximately 6% [2-11%] relative to the IT-1 level.

Interim target-3 (IT-3): In addition to other health benefits, these levels reduce the mortality risk by approximately 6% [2-11%] relative to the IT-2 level.

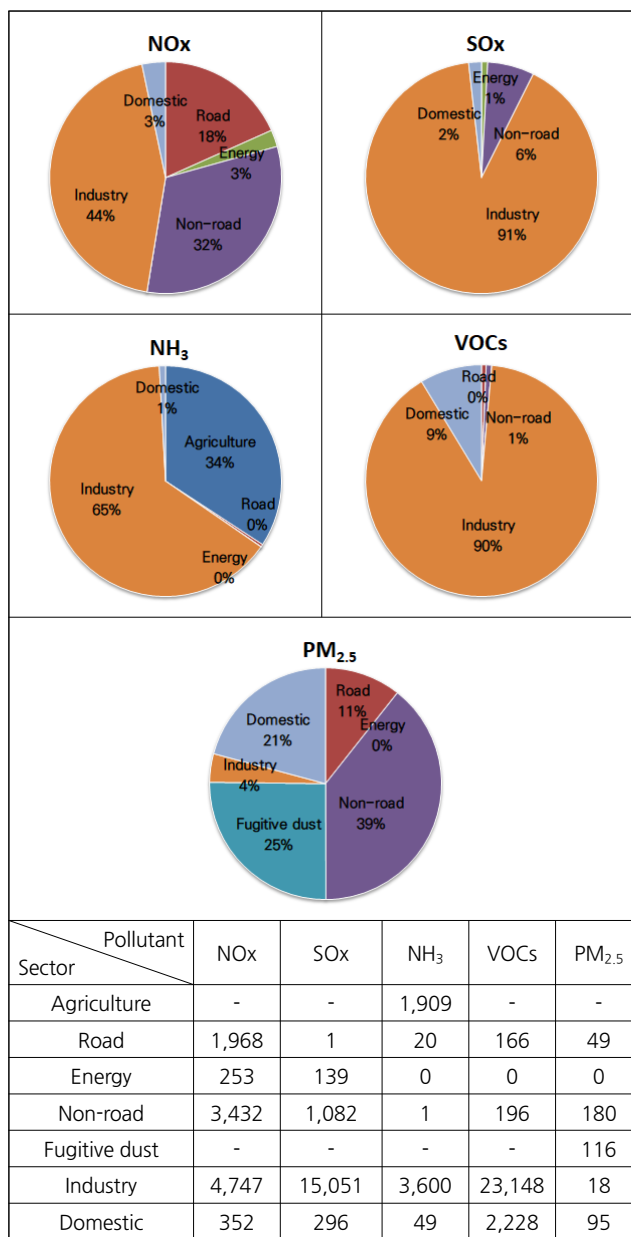
Table S2. Descriptions of source classification in CAPSS.

Category	Large scale classification in CAPSS	Medium scale classification in CAPSS
발전 (Energy)	에너지산업 연소 (Energy production)	공공발전시설(Public power generation), 민간발전시설(Private power generation), 지역난방시설(District heating production plants)
	생산공정 (Industrial processes)	기타 제조업(Other industry), 목재/펄프 제조업(Pulp and paper industry), 무기화학제품 제조업(Inorganic chemical industry), 석유제품산업(Petroleum industry), 식음료 가공(Food and beverage industry), 암모니아 소비(Ammonia consumption), 유기화학제품 제조업(Organic chemical industry), 제철제강업(Iron and steel industry)
산업 (Industry)	에너지산업 연소 (Energy production)	석유정제시설(Oil refinery)
	에너지수송 및 저장 (Energy transport and storage)	휘발유 공급(Gasoline supply)
	유기용제 사용(Solvent use)	기타 유기용제사용(Other solvent use), 도장시설(Painting facilities), 세정시설(Washing facilities)
	제조업 연소 (Manufacturing industry)	공정로(Processes), 기타(Others), 연소시설(Combustion facilities)
	폐기물처리 (Waste treatment)	기타 폐기물 처리(Other waste treatment), 폐기물소각(Waste incineration)
도로 (Road)	도로이동오염원 (Road transport)	RV, 버스(Buses), 승용차(Passenger cars), 승합차(Vans), 이륜차(Two-wheeled vehicles), 택시(Taxis), 특수차(Special cars), 화물차(Freight cars)
비도로 (Non-road)	비도로이동오염원 (Non-road transport)	건설장비(Construction machineries), 농업기계(Agricultural machineries), 선박(Ships), 철도(Railroads), 항공(Aircrafts)
비산먼지 (Fugitive dust)	비산먼지 (Fugitive dust)	건설공사(Construction), 나대지(Playground), 농업활동(Agricultural), 도로재비산먼지(Paved road dust), 비포장도로 비산먼지(Unpaved road dust), 축산활동(Livestock), 폐기물처리(Waste treatment), 하역 및 야적(Load and unload)
	기타 면오염원(Other)	동물(Human and animal), 산불 및 화재(Forest fire and other fire)
생활 (Domestic)	비산업연소(Non industry)	농업/축산/수산업시설(Plants in agriculture, forestry and aquaculture), 상업 및 공공시설(Commercial and institutional facilities), 주거용 시설(Residential facilities)
	생물성 연소 (Biomass burning)	고기 및 생선구이(Grilled meat and fish), 노천소각(Open burning), 농업잔재물 소각(Agricultural residue incineration), 목재난로 및 보일러(Wood stoves and boilers), 숯가마(Charcoal burner), 아궁이(Furnace)
	에너지수송 및 저장 (Energy transport and storage)	휘발유 공급(Gasoline supply)
	유기용제 사용(Solvent use)	기타 유기용제사용(Other solvent use), 도장시설(Painting facilities), 세탁시설(Laundry facilities)
농업 (Agriculture)	농업(Agriculture)	분뇨관리(Manure management), 비료사용농경지(Fertilizer use)



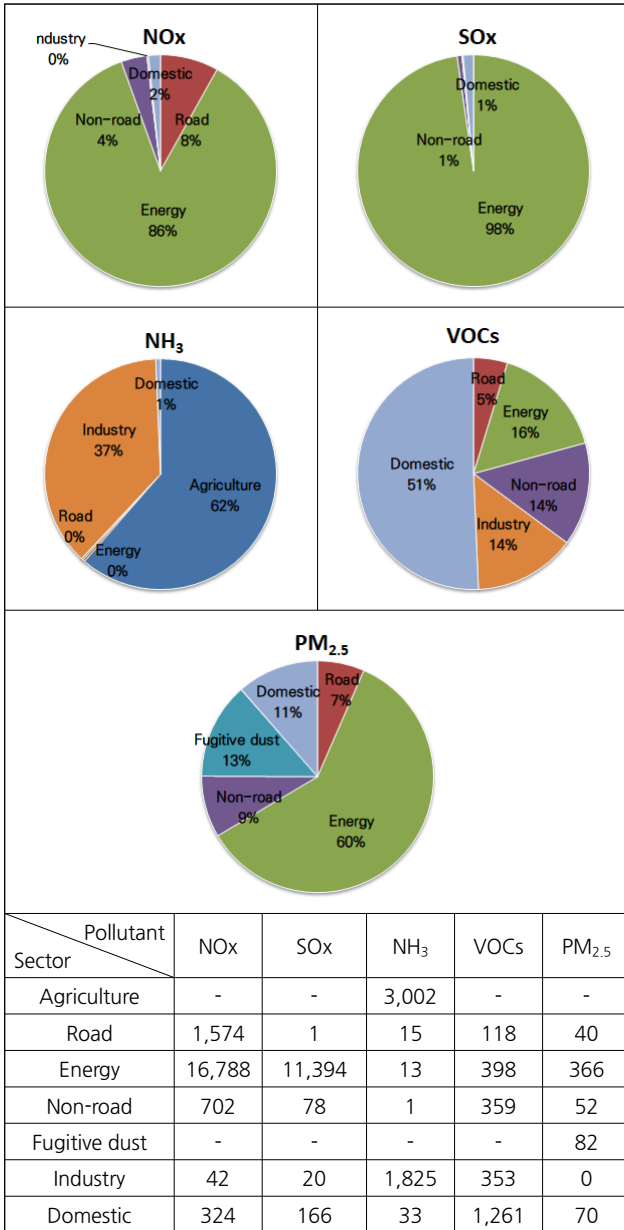
Source: CAPSS 2016.¹¹⁾

Fig. S1. The national air pollutants emissions in Dangjin (tons/year).



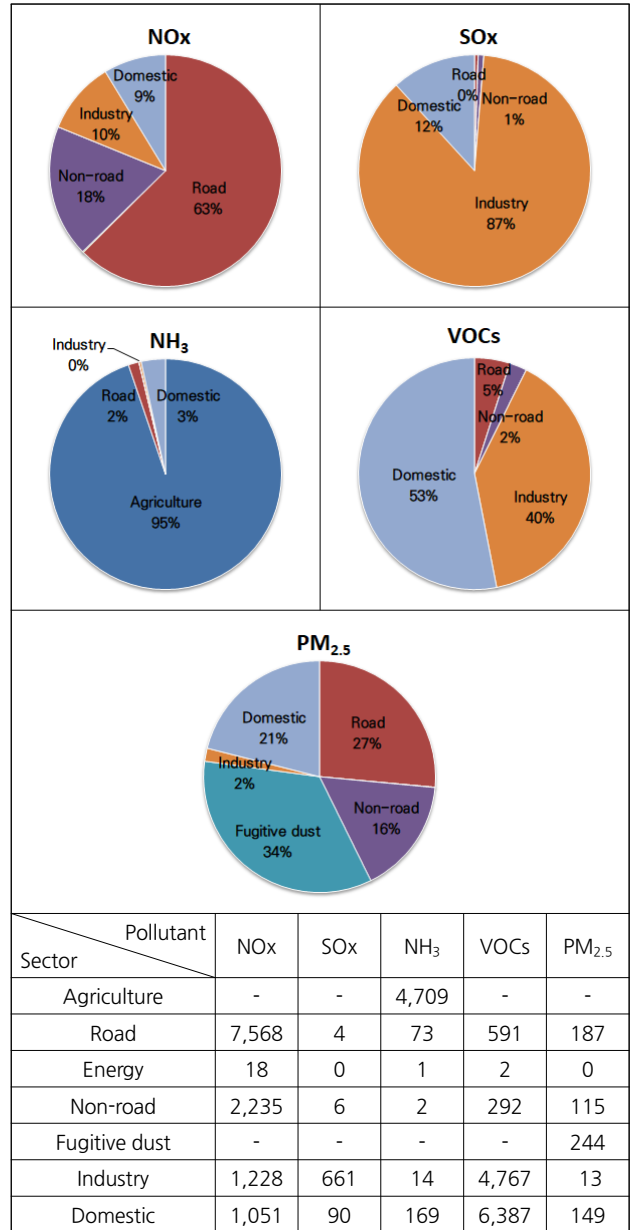
Source: CAPSS 2016.¹¹⁾

Fig. S2. The national air pollutants emissions in Seosan (tons/year).



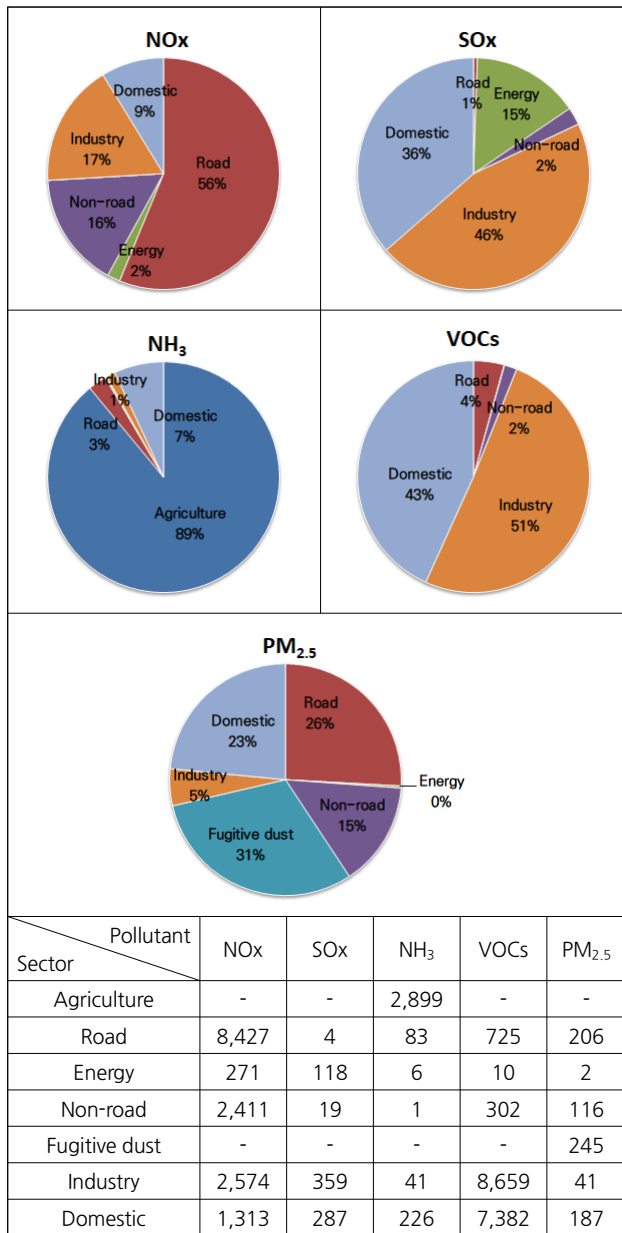
Source: CAPSS 2016.¹¹⁾

Fig. S3. The national air pollutants emissions in Boryeong (tons/year).



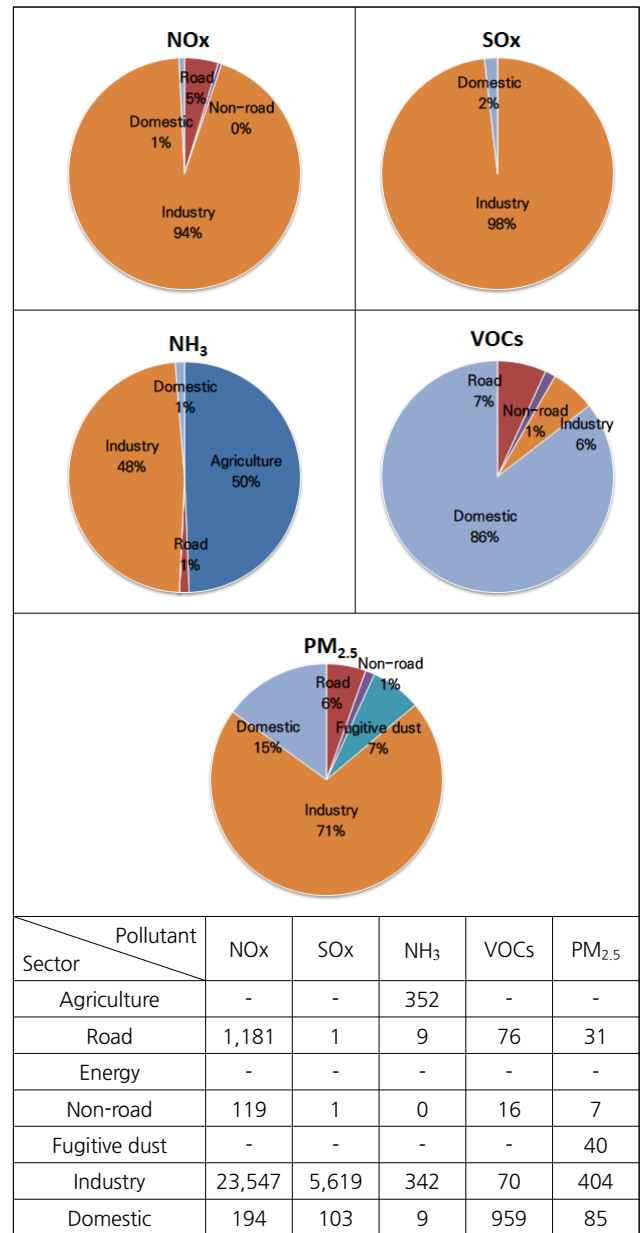
Source: CAPSS 2016.¹¹⁾

Fig. S4. The national air pollutants emissions in Cheonan (tons/year).



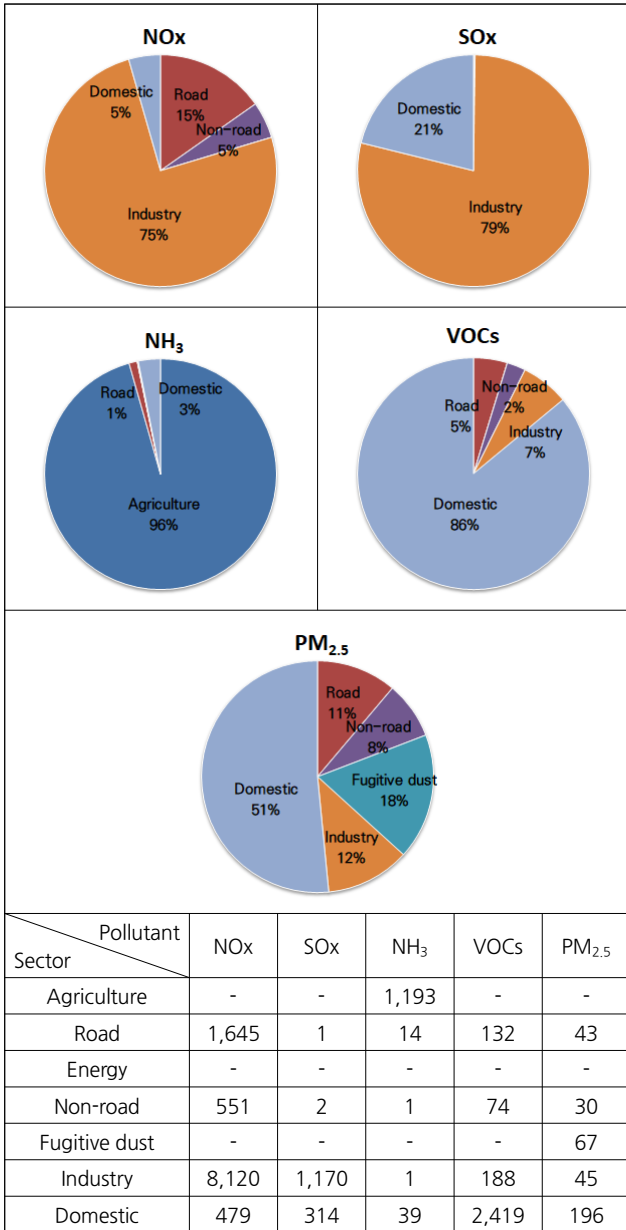
Source: CAPSS 2016.¹¹⁾

Fig. S5. The national air pollutants emissions in Cheongju (tons/year).



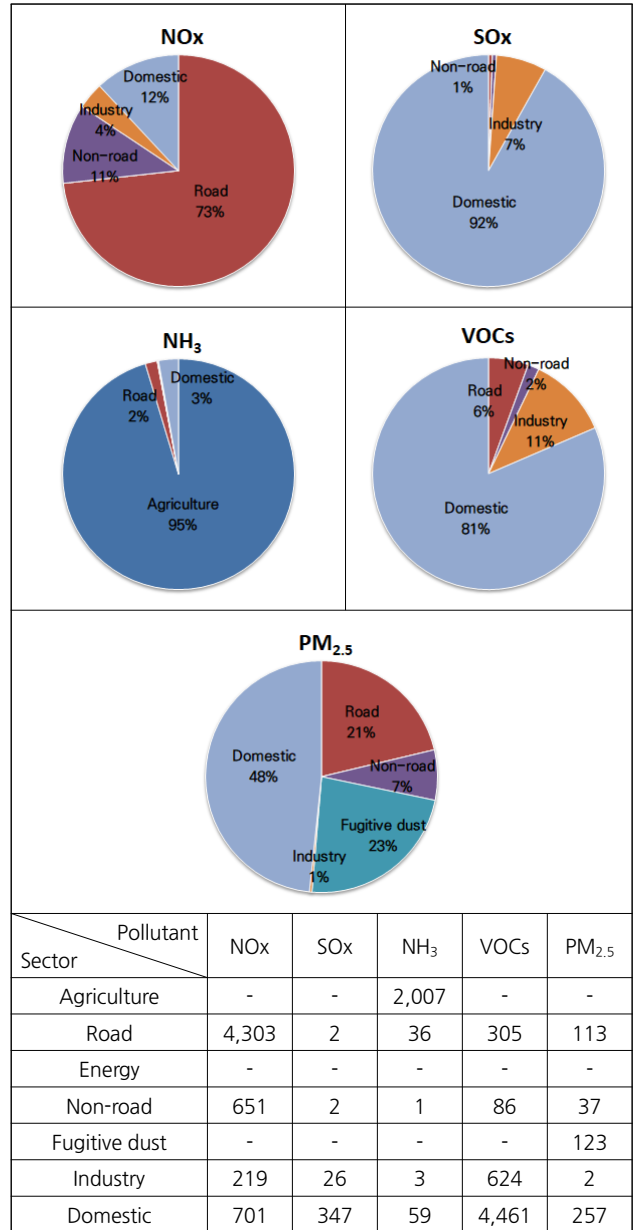
Source: CAPSS 2016.¹¹⁾

Fig. S6. The national air pollutants emissions in Danyang (tons/year).



Source: CAPSS 2016.¹¹⁾

Fig. S7. The national air pollutants emissions in Jecheon (tons/year).



Source: CAPSS 2016.¹¹⁾

Fig. S8. The national air pollutants emissions in Chungju (tons/year).