

AIM/China: Inventory and Model Application

ERI AIM Project team

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AIM/inventory: Progress in 2004-2005

- CH₄, N₂O emission from Agriculture
- 32 new LPS for Power sector
- 12 new LPS for cement
- 84 LPS for Beijing

CH₄ and N₂O Emission Inventory: 2000

- 23 province data for nearly 1800 counties, another 8 province not available
- Emission including CH₄ from Rice, CH₄ from Animal, CH₄ from Coal Mining, N₂O from Fertilizer
- Basic data includes Paddy field, Irrigated area, Rice, Slaughter Cattle and Buffaloes, Pork, Beef and mutton, Pig stock, Beef output, Large Animals, Meat output, Fertilizer use, Yield of grain, coal production,

Regional1_Name	Regional2_Name	Area (km2)	Driving Force				Emission			
			CH4 from Rice	CH4 from Animal	CH4 from Coal Mining	N2O from Fertilizer	CH4 from Rice (t-CH4)	CH4 from Animal (t-CH4)	CH4 from Coal Mining (t-CH4)	N2O from Fertilizer (Gg N2O)

Province	Name of Driving Force	Irrigated area	Slaughter Cattle and Buffaloes	Fertilizer use
Province	Unit of Driving Force	1000Ha		ton

Anhui	subtotal	####	3,167	2,436,416	4,167	2,515,777	744	402	432	89
Anhui	HEFEI CITY	478	11	116		8,772	2.61869344	0.01914173	0	0.30993227
Anhui	CHANGFENG	2,212	94	11,400		80,049	22.16721646	1.88116998	0	2.82829091
Anhui	FEIDONG	2,204	101	8,613		64,237	23.70223156	1.42127342	0	2.2696214
Anhui	FEIXI	2,252	66	4,522		30,578	15.44888087	0.74619742	0	1.08038176
Anhui	WUHU CITY	153	6	243		5,517	1.358711677	0.04009862	0	0.19492662
Anhui	WUHU	956	29	1,260		20,863	6.746544141	0.20791879	0	0.73713142
Anhui	FANCHANG	850	20	1,954		11,576	4.694372352	0.32243913	0	0.40900318
Anhui	NANLING	1,201	31	4,267		20,068	7.28955867	0.70411862	0	0.70904249
Anhui	BENGBU CITY	377	15	1,737		9,839	3.450845575	0.2866309	0	0.3476315
Anhui	HUAIYUAN	2,337	44	30,336		54,732	10.40425239	5.00589232	0	1.93379078
Anhui	WUHE	1,562	85	70,170		147,091	20.07743328	11.5790963	0	5.19701856
Anhui	GUZHEN	1,400	36	70,932		57,832	8.52603331	11.7048376	0	2.04331997
Anhui	HUAINAN CITY	1,004	38	36,518	1,325	36,113	8.928005104	6.02601449	137.471844	1.27594436
Anhui	FENGTAI	1,073	51	57,817	605	36,955	11.96512532	9.54066707	62.7701629	1.3056939
Anhui	MA'ANSHAN CITY	278	5	264		3,200	1.168303985	0.04356394	0	0.11306239
Anhui	DANGTU	1,439	43	1,200		26,683	10.13392049	0.19801789	0	0.94276364
Anhui	HUAIBEI CITY	263	10	3,818	1,637	5,866	2.237878057	0.63002693	169.842573	0.20725749
Anhui	SUIXI	2,297	63	29,504		59,836	14.74836862	4.86859991	0	2.11412529
Anhui	TONGLING CITY	89	5	112		2,889	1.269384612	0.01848167	0	0.10207414
Anhui	TONGLING	929	19	204		14,450	4.372324775	0.03366304	0	0.51054734
Anhui	ANQING CITY	453	7	438		6,398	1.746579198	0.07227653	0	0.22605411
Anhui	HUAINING	1,577	33	7,423		12,892	7.839625335	1.22490568	0	0.45550009
Anhui	ZONGYANG	1,833	40	4,328		25,073	9.473370345	0.71418453	0	0.88587912
Anhui	QIANSHAN	1,636	24	2,503		7,584	5.545330184	0.41303232	0	0.26795785
Anhui	TAIHU	2,003	20	14,510		21,733	4.748438734	2.39436635	0	0.76787026
Anhui	SUSONG	2,341	44	8,939		30,346	10.28201536	1.47506828	0	1.07218474
Anhui	WANGJIANG	1,301	32	5,884		26,332	7.477615649	0.97094773	0	0.93036211

LPS for Power Generation and Cement

- In 2004, there are nearly 50GW new power plant getting into operation
- Cement output surged to 950million ton, with several very large cement plants constructed(3 10000ton/day cement kiln, while all together 4 kiln in the world)
- 42 new LPS for Power sector
- 12 new LPS for cement

300MW以上火力发电机组SO ₂ 排放量										计算
序	电厂名称			机组号	建厂	投产	装机	燃料	规模	发电量
号					(年)	年	(万KW)		(万KW)	万kWh)
				2			60			
	乌兰察布电厂		察右前旗							
				1			30			
				2			60			
				3			60			
				4			60			
				5			60			
	多伦电厂		锡盟多伦县				120			
				1			60			
				2			60			
	岱海电厂二期扩 建工程						120			
				1			60			
				2			60			
	托克托电厂	60				2003.9	120			
				1			60			
				2			60			
	托克托B厂						360			
				1			60			
				2			60			
				3			60			
				4			60			
				5			60			
				6			60			
	临河热电厂		巴盟			2003.9	60			

LPS for Beijing

84 LPS for Beijing with location

- 7 Power plants
- 9 Central Supplied Heat plants
- 21 District Heat Plants
- 9 Chemical Industries
- 8 Food Factories
- 12 Machinery Factories
- 18 others

Various data source: an examples

18家供暖单位锅炉严重超标

来源：作者：admin

本报讯（记者杜鹃）在全市各有关部门全力为本市今年二级和好于二级天数达到全年天数62%以上的目标而共同努力的时候，一些供暖企业和单位却无视来之不易的大气环境治理成效，放松对燃煤锅炉的污染控制，还在排放超过国家标准10倍以上的二氧化硫等污染物，极大地破坏了本市的大气环境。昨天，市环保局公布了这些供暖单位的名单，并将对这些单位依法进行处罚。

据市环保局有关负责人介绍，最近几天，在北京市空气监测中心的统计报表上显示，市区空气质量连续数天都出现首要污染物为二氧化硫的三级天，这说明目前本市燃煤造成的二氧化硫污染仍然十分严重。为了有效降低二氧化硫污染，保障群众的身体健康，确保全年二级及好于二级天数达到62%的目标，1月29、31日，市环保监察队会同市环保监测中心对市区29家单位的燃煤锅炉二氧化硫排放情况进行了检查监测，发现超标现象普遍，污染物排放超标的单位共计达18家，超标率为62%。经了解，超标的原因主要是这些单位失于监控，放松管理造成的。其中，有的是操作不规范，不能及时足量添加脱硫剂，有的是脱硫除尘设施不能保证稳定运行，还有仍燃用高硫煤等违法行为所造成的。其中北京亚新科天纬油泵油嘴股份有限公司的锅炉排放浓度为1569 mg/m³，超过标准10倍以上；总后勤部司令部管理局丰台热力站的锅炉排放浓度为1003mg/m³，超过标准近7倍，污染十分严重

LPS database for Beijing

序号	所属区县	单位名称	单位地址
1	石景山区	北京大唐发电股份有限公司高井发电厂	北京市石景山区高井
2	海淀区	北京同力物业管理有限责任公司	永丰中路99号
3	石景山区	北京京能热电股份有限公司	北京市石景山区广宁路10号
4	石景山区	北京首钢超群电力有限公司	北京市石景山区石景山路首钢厂区内
5	朝阳区	北京市朝阳区国土资源和房屋管理局供暖公司 团结湖供暖所	水碓东路甲10号
6	丰台区	北京恩布拉科雪花压缩机有限公司	丰台区永定门外贾家花园15号
7	海淀区	北京市新京物业管理有限责任公司	北京市海淀区永定路西里小区12号楼
8	朝阳区	北京市朝阳区国土资源和房屋管理局供暖公司 设备安装队	左家庄北里25号楼
9	石景山区	北京染中靛纺织品科技发展有限公司	北京市石景山区八大处路51号
10	丰台区	北京市华都建筑总公司	马家堡南街39号
11	朝阳区	北京房管一物业管理有限责任公司和平里分公司 (和平街10区锅炉房)	和平街10区甲16楼
12	石景山区	北京重型电机厂	北京市石景山区吴家村
13	朝阳区	北京市朝阳区水处理剂厂	北京市朝阳区郎各庄村
14	朝阳区	北京市垂杨柳联合供热站	朝阳区垂杨柳中街2号
15	丰台区	首都航天机械公司	丰台区南苑警备东路2号
16	海淀区	北京力新达物业管理有限责任公司	北京市海淀区北清路1号(北京北分瑞利分析仪器集团厂内)
17	东城区	北京房管一物业管理有限责任公司和平里分公司 (和平里七区锅炉房)	东城区和平里七区19号楼
18	朝阳区	北京市恒联物业管理有限责任公司	朝外三丰里24号楼
19	石景山区	北京鲁谷集中供热厂	北京市石景山区衙门口村东
20	海淀区	北京市吉润物业管理中心	海淀区小南庄四方小区
21	朝阳区	北京乐都物业管理中心	北京市朝阳区三元里街21号楼院内

LPS database for Beijing

name	Address	东经	北纬
北京第三制药厂		116.17.32	39.52.44
北京恩布拉科雪花压缩机有限公司	丰台区永定门外贾家花园15号	116.16.20	39.52.56
北京二热		116.12.1	39.52.41
北京房管一物业管理有限责任公司和平里分公司(和平街10区锅炉房)		116.7.42	39.53.8
北京化工二厂		116.6.37	39.54.57
北京化工实验厂		116.7.50	39.53.49
北京焦化厂		116.11.39	39.52.11
北京京能热电股份有限公司	北京市石景山区广宁路10号	116.12.59	39.52.11
北京卷烟厂		116.12.18	39.52.16
北京兰翎酒业公司		116.13.18	39.52.6
北京鲁谷集中供热厂	北京市石景山区衙门	116.15.1	29.52.0
北京燃料总厂		116.16.28	39.52.8
北京市朝阳区水处理剂厂	北京市朝阳区郎各庄村	116.18.10	39.49.59
北京市垂杨柳联合供热站	朝阳区垂杨柳中街2号	116.21.1	39.49.40
北京市华都建筑总公司		116.22.3	39.49.32
北京市化工三厂		116.22.21	39.49.31
北京市橡胶厂		116.22.24	39.49.20
北京首钢超群电力有限公司	北京市石景山区石景山路首钢厂区内	116.22.36	39.49.25
北京铜厂		116.22.47	39.49.28

Application of AIM/China in 2004-2005

Climate Change Strategy in China

Beijing Environment Research Project

EMF-22

APEIS/RISPO

Impact of WTO on Energy and Environment

Energy Forecast up to 2030

Guangdong Energy Development Strategy

Environmental and economic impact of SO₂ policies:
application of AIM/CGE for China case

Contribute to:

National Report on Climate Change

National Report on Climate and Environment Science

CDM Assessment in China, World Bank Publication

Scenario for Beijing

Three Scenarios:

- *Government promotion (BaU)*
- *Technology Progress (TG)*
- *Clean future (CF)*

SPO Applied	Government Promotion	Technology Progress	Clean Future
Rail-based mass rapid transit, MRT, km	2000:56:00	Same	Same
	2008: 300		
	2020: 1000		
Promotion of Alternative Fuel Vehicles: number of Clean fuel bus	2000: 3680 2020: 10000	2000: 3680	2000: 3680
		2020: 12000	2020: 12000
Vehicle emission standard and Inspection/Maintenance	2007: EURO III	2005: EURO III	2005: EURO III
		2010: EURO IV	2010: EURO IV
Parking policy		Increase	Increase
Improved bus routes and services		Bus lane Better interchange	Bus lane Better interchange
Intelligent Transport System (ITS)		Finish by 2006	Finish by 2006
Promotion of Alternative Fuel Vehicles			2007: E15%
Promotion of High Efficiency Vehicles		2005:Hybrid car	2005:Hybrid car
		2005: new diesel car	2005: new diesel car
		2013: fuel cell car	2013: fuel cell car
Promotion of High Efficiency Vehicles		Mini Car : Incentive policies	Mini Car : Incentive policies
Improved bus routes and services		Public interchange	Public interchange Bicycle
Public awareness raising on environmentally friendly driving			Public transport Energy saving driving
Information Technology based communication and services to reduce transportation need			Tele-conference, on-line shopping, nearby service
Promotion of special lanes for walking and cycling		adopted	adopted
Vehicle fuel standard		adopted	adopted
Greening fuel tax			Fossil fuel based tax by 2006

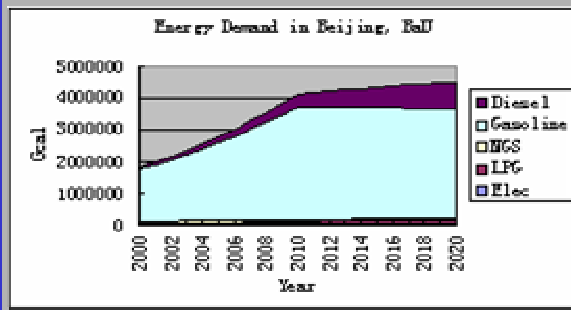


Figure 3 Energy demand for Beijing Urban Transport, BaU scenario

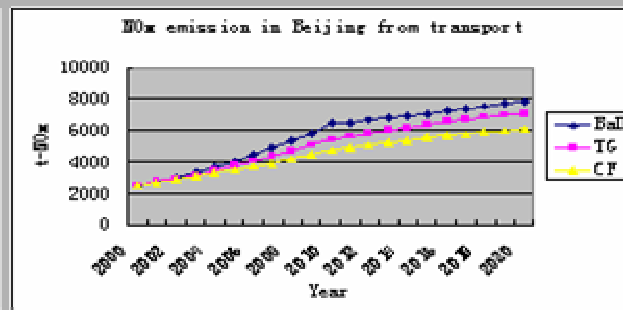


Figure 4. NOx emission from urban transport in Beijing

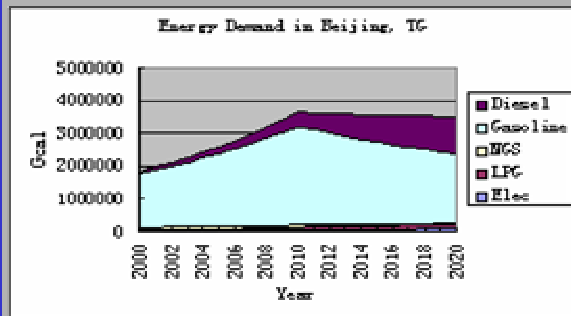


Figure 3 Energy demand for Beijing Urban Transport, TG scenario

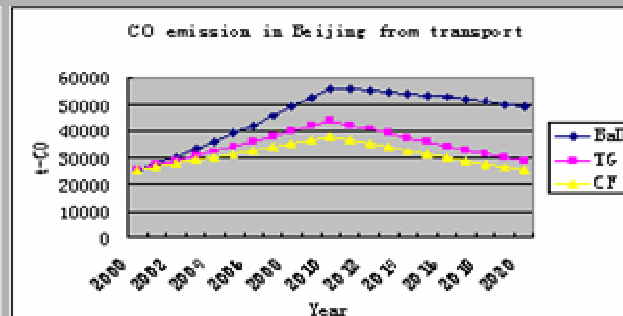


Figure 6 CO emission from urban transport in Beijing

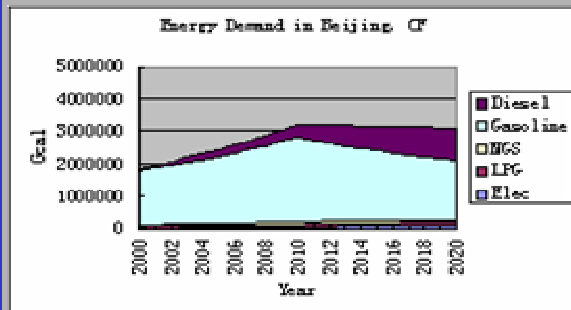


Figure 7. Energy demand for Beijing Urban Transport, CF scenario

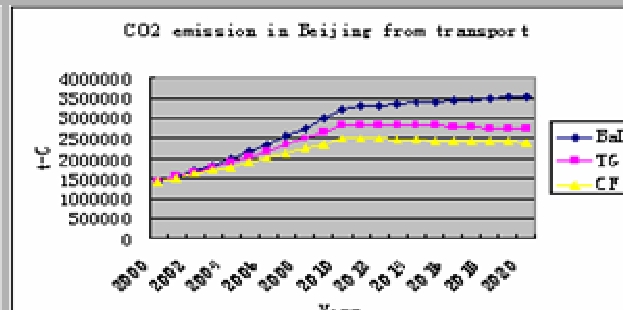


Figure 3. CO₂ emission from urban transport in Beijing

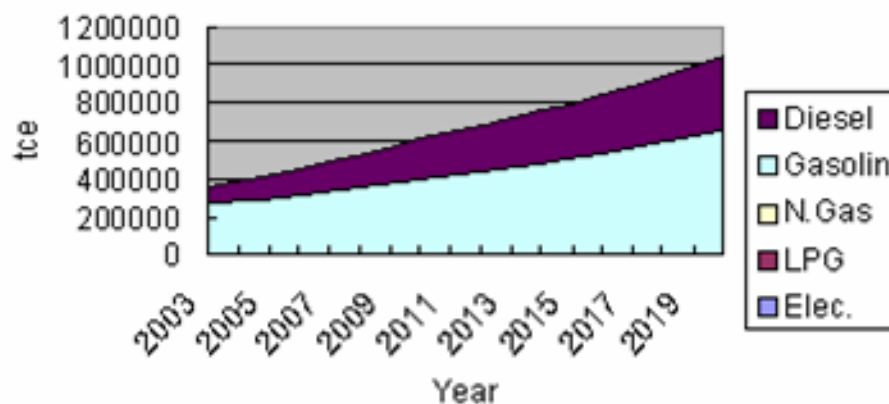
Scenario for Taiyuan

Three Scenarios:

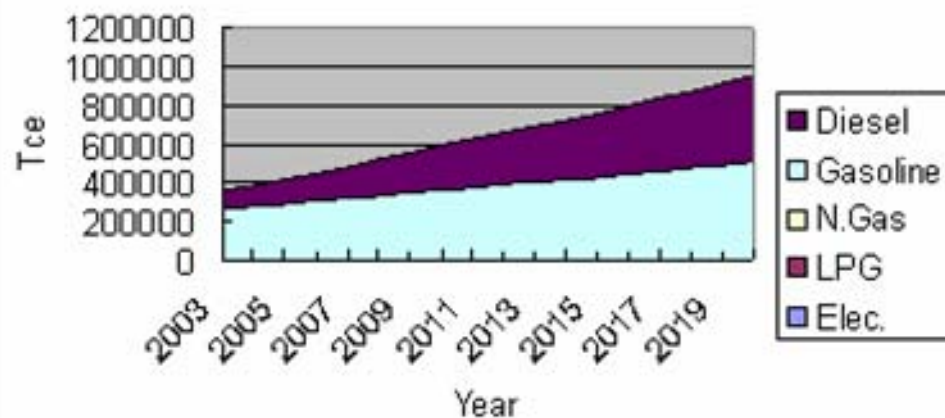
- *Government promotion (BaU)*
- *Technology Progress (TG)*
- *Clean future (CF)*

SPO Applied	Government Promotion	Technology Progress	Clean Future
Rail-based mass rapid transit, MRT, km	2000: 0		2020:180
	2020: 0		
Promotion of Alternative Fuel Vehicles: number of Clean fuel bus	2003:00:00	2003:00:00	2003:00:00
	2020:00:00	2020: 120	2020: 800
Vehicle emission standard and Inspection/Maintenance	2008: EURO III	2005: EURO II	2007: EURO III
		2008: EUROIII	2010: EURO IV
Parking policy		Increase	Increase
Improved bus routes and services		Bus lane Better interchange	Bus lane Better interchange
Intelligent Transport System (ITS)		Finish by 2008	Finish by 2008
Promotion of Alternative Fuel Vehicles			2007: E15%
Promotion of High Efficiency Vehicles		2006:Hybrid car	2006:Hybrid car
		2007: new diesel car	2007: new diesel car
		2013: fuel cell car	2013: fuel cell car
Promotion of High Efficiency Vehicles		Mini Car : Incentive policies	Mini Car : Incentive policies
Improved bus routes and services		Public interchange	Public interchange Bicycle
Public awareness raising on environmentally friendly driving			Public transport Energy saving driving
Information Technology based communication and services to reduce transportation need			Tele-conference, on-line shopping, nearby service
Promotion of special lanes for walking and cycling		adopted	adopted
Vehicle fuel standard		adopted	adopted
Greening fuel tax			Fossil fuel based tax by 2006

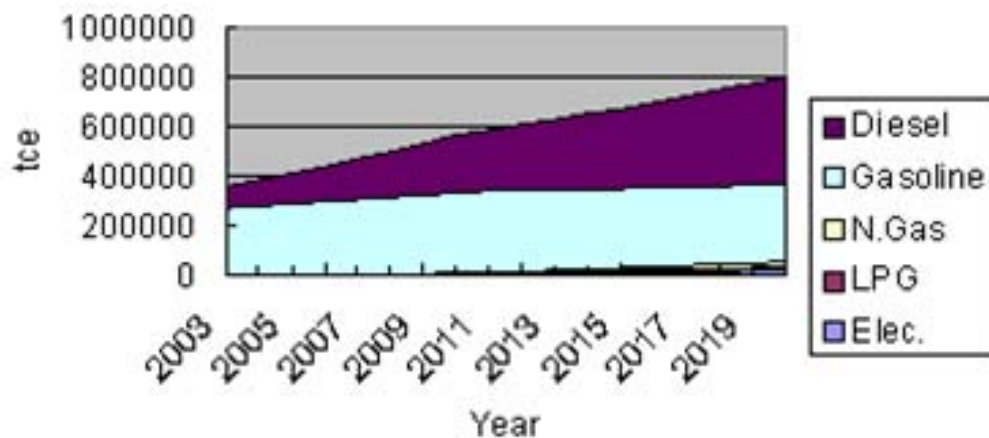
Energy Demand in Urban transport in Taiyuan, Baseline scenario



Energy Demand in Urban Transport in Taiyuan, Technology Scenario



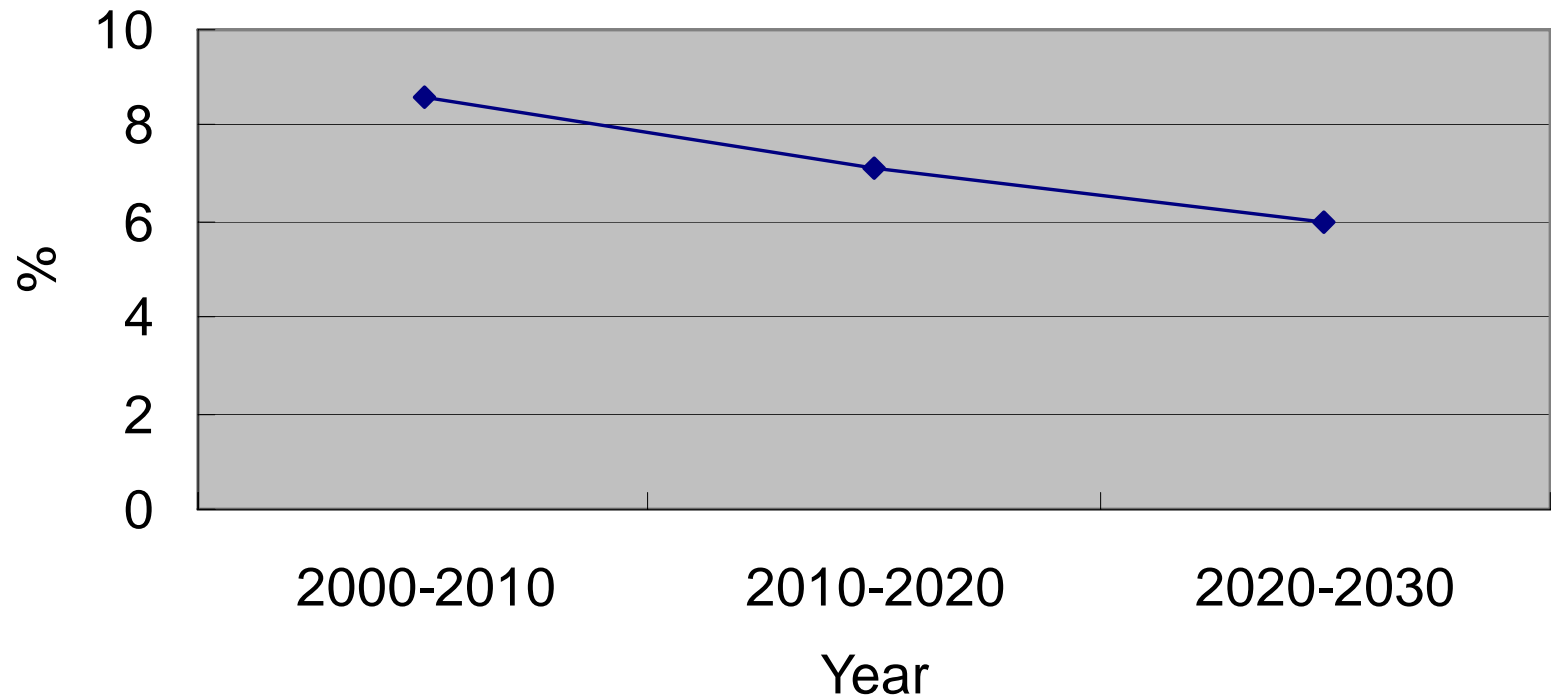
Energy Demand in Urban Transport in Taiyuan, Policy Scenario



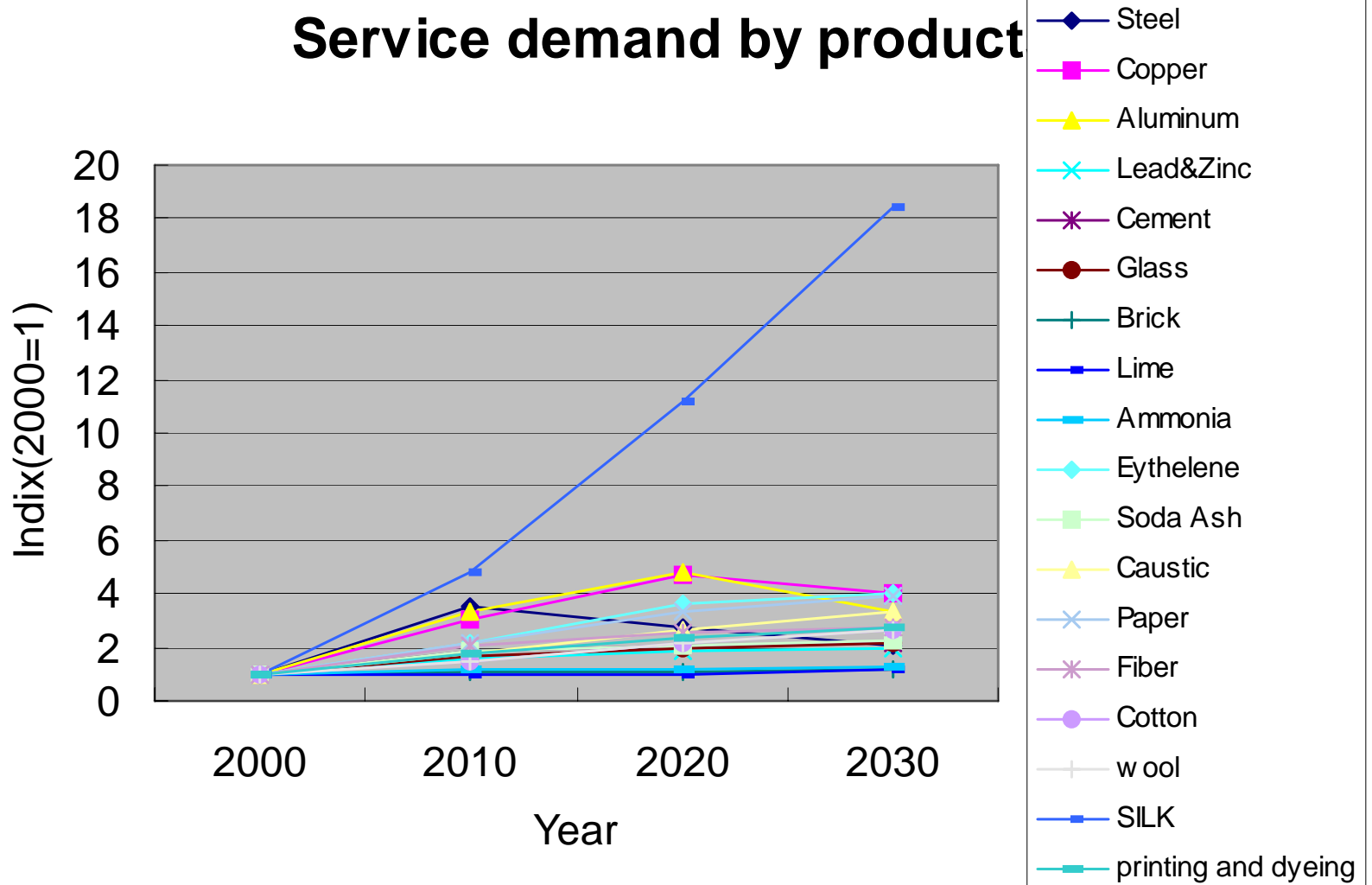
Energy and Emission Forecast in China: Population scenario

		2000	2010	2020	2030
Total population	milliom	1267.43	1368.00	1445	1500
Share of City	%	0.36	0.48	0.57	0.66
Urban Pop	milliom	458.81	649.80	823.65	990.00
Rural Pop	milliom	808.62	718.20	621.35	510.00

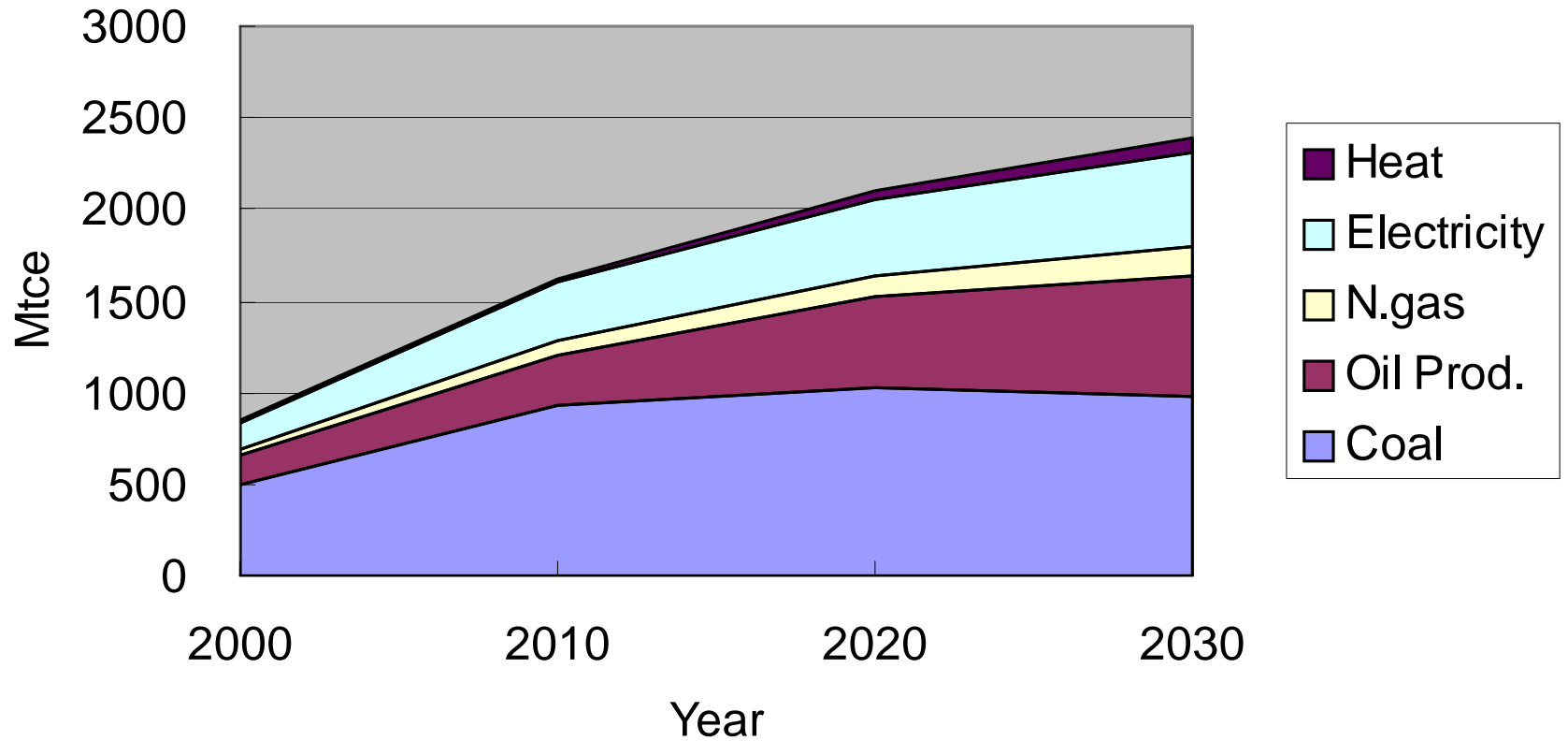
GDP growth rate in China



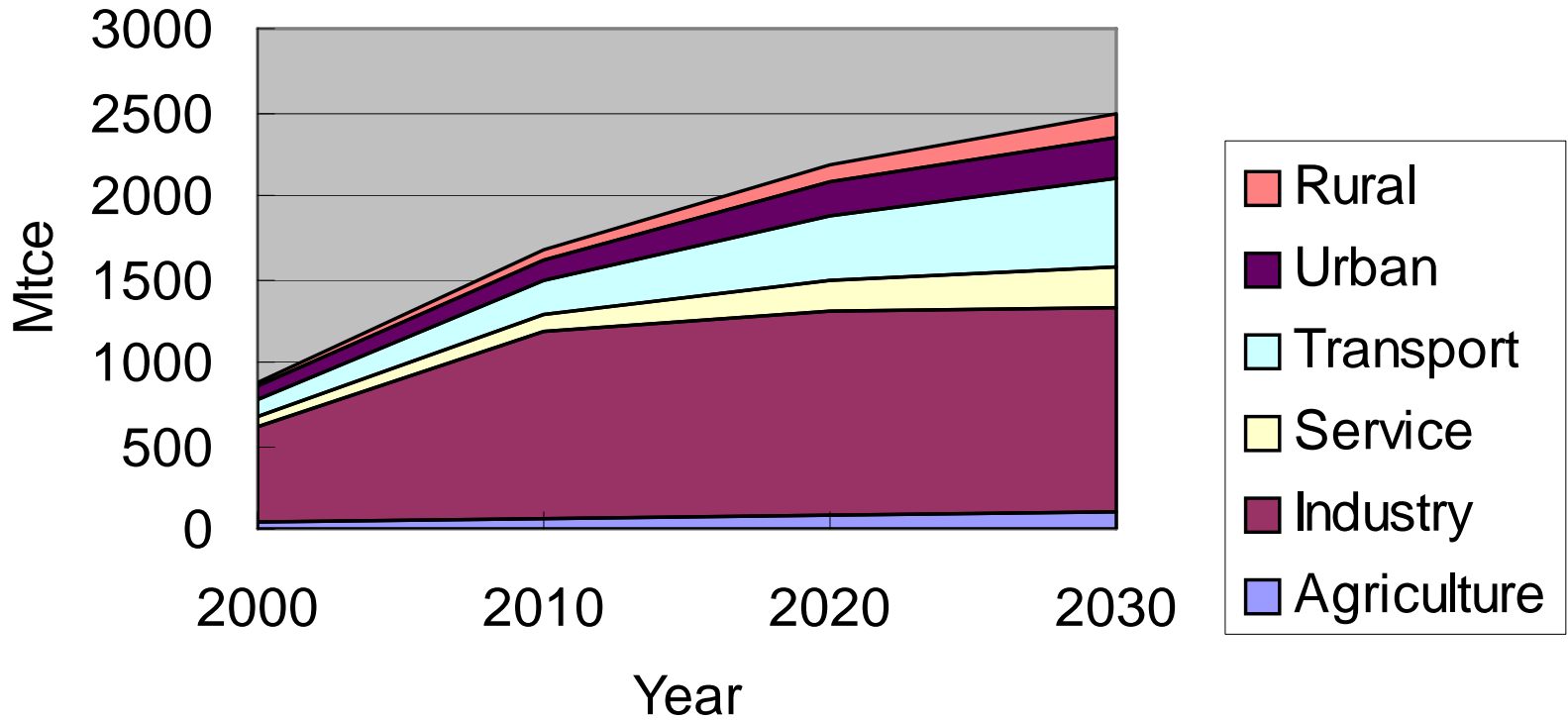
Service demand by product



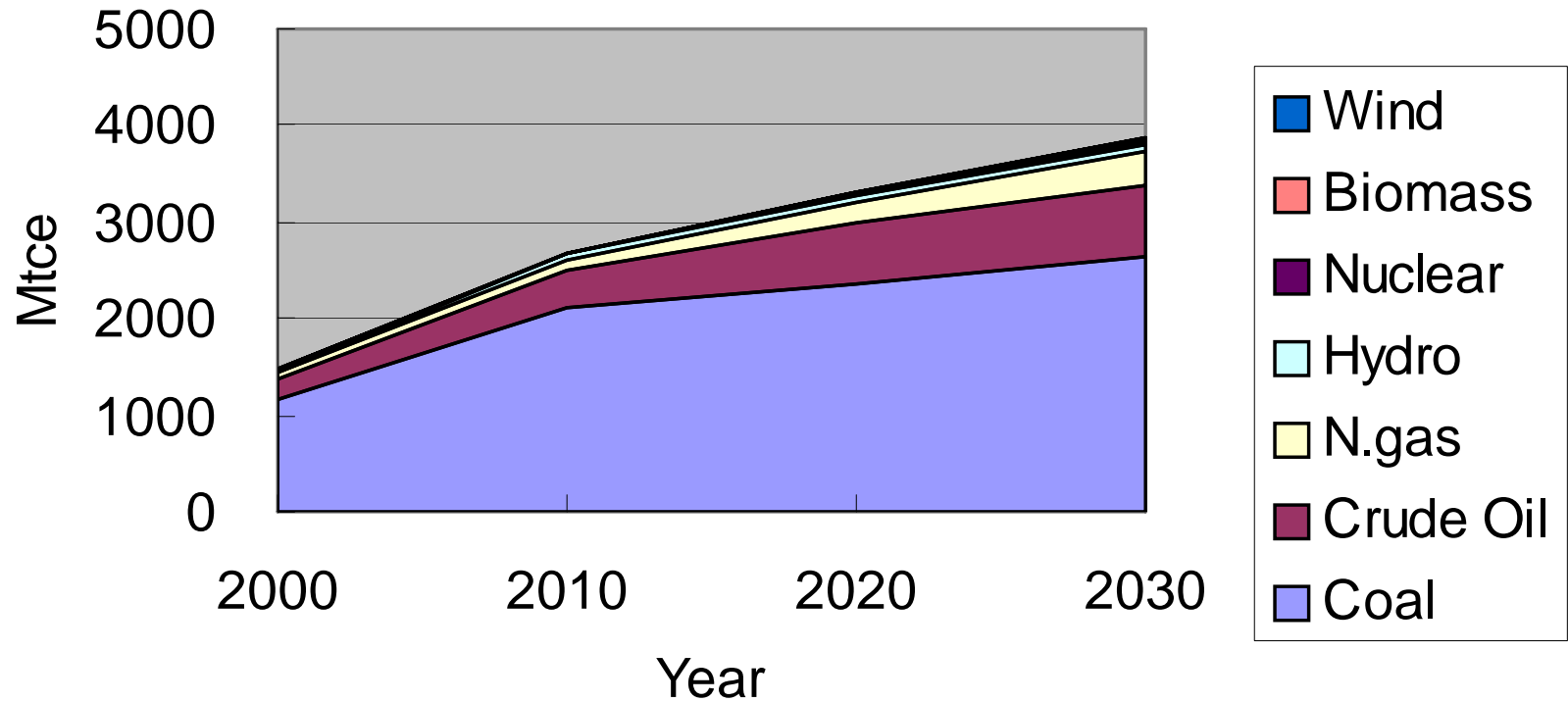
Final Energy Demand in China



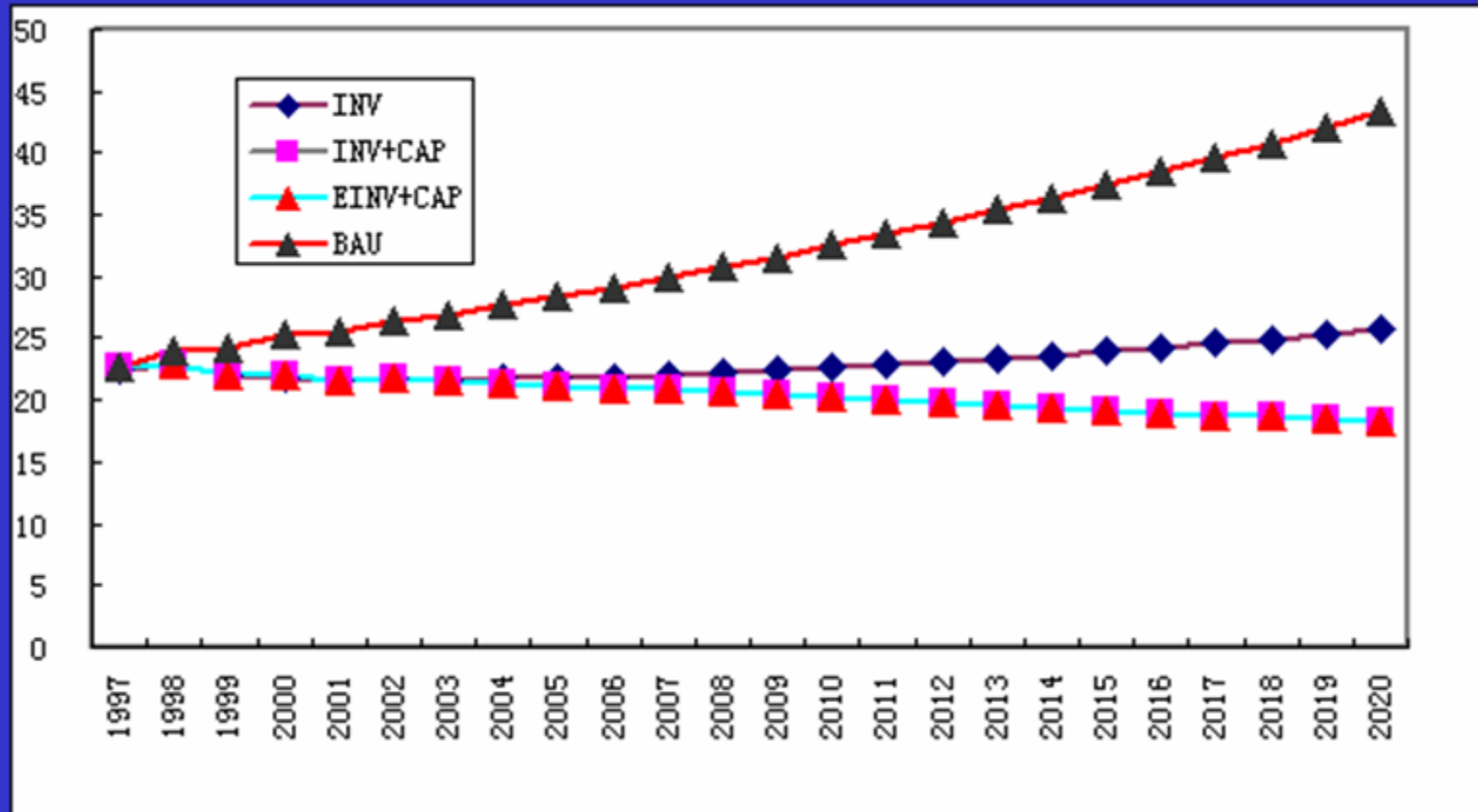
Final energy demand by sector in China



Primary energy demand in China



Application of AIM/CGE for China case



Next Step of IPAC-AIM/China

Energy and Emission Scenario for China

Using AIM/Country for China Energy Scenario Forum

Other pollutant: PM10, water pollution, land damage

Energy Strategy up to 2050

IPCC AR4

EMF-22

Energy regulation and financial measures

Energy planning for Guangdong and Hainan

Global Oil Market in 2030

Energy intensive material model

Next Step of IPAC-AIM/China

AIM/Local:

AIM/Local-Refinery

AIM/Local-Chemical

AIM/Local-Other

More LPS information

AIM/Beijing

AIM/Chongqing

AIM/Hainan

GIS information

Linked with AIM/Air