
NEASPEC North-east Asia Low Carbon Cities Platform (NEA-LCCP) Expert Group Workshop (EGW)

Self-evaluation Report of National Pilot Low-carbon City ----Guangzhou

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一、基本情况 Basic city data

二、低碳发展理念 Low-carbon Strategy

三、低碳发展任务落实与成效
Implementation and Effects of LCD

四、基础工作与能力建设
Capacity Building

五、体制机制创新
Mechanism Innovation

六、低碳发展经验分享
Experience Sharing

七、投资项目 Investment Projects

八、下一步工作计划及工作建议
Next-step Plan and Suggestion





Basic Data

1. Current Status of the City

Current Status of the City

Economic
经济

- 地区生产总值: 18100亿元
GDP: CNY 1810 Billion
- 三产结构: 1.26:31.97:66.77
Industrial Structure

Society
社会

- 常住人口: 1350.11万
Population: 13500 Thousand
- 居民人均可支配收入:
Per-capita disposable income of
residents: CNY 46735 (urban), 19323
(rural)
- 城镇化率: 85.53%
Urbanization Rate

Environment
环境

- 森林覆盖率 Forest coverage : 42.03%
- 城市建成区绿化覆盖率: 41.53%
- PM2.5: $39 \mu\text{g}/\text{m}^3$
- PM10: $59 \mu\text{g}/\text{m}^3$

Energy
能源

- 能源消费量 Energy Consumption:
54965 thousand TCE
- 消费结构 Energy structure: Oil
41.97%、Coal 22.65%, purchased
Power 26.87%, NG 5.9%, Others
2.61% (2014)

Emission
排放

- 能源活动总排放 Emission by energy
incurred: 110 Million Ton CO₂
- 排放结构 Emission structure : Coal
29.8%, Oil 43.4%, purchased
Power 22%, NG 4.8% (2014)

Energy intensity
单位能耗
排放

- 万元GDP能耗 Energy intensity:
0.348tce/10 thousand Yuan
- 人均能耗 Energy consumption per
capita: 4.2tce/a
- 万元GDP碳排放 Emission intensity:
0.69ton CO₂/10 thousand Yuan
(2014)

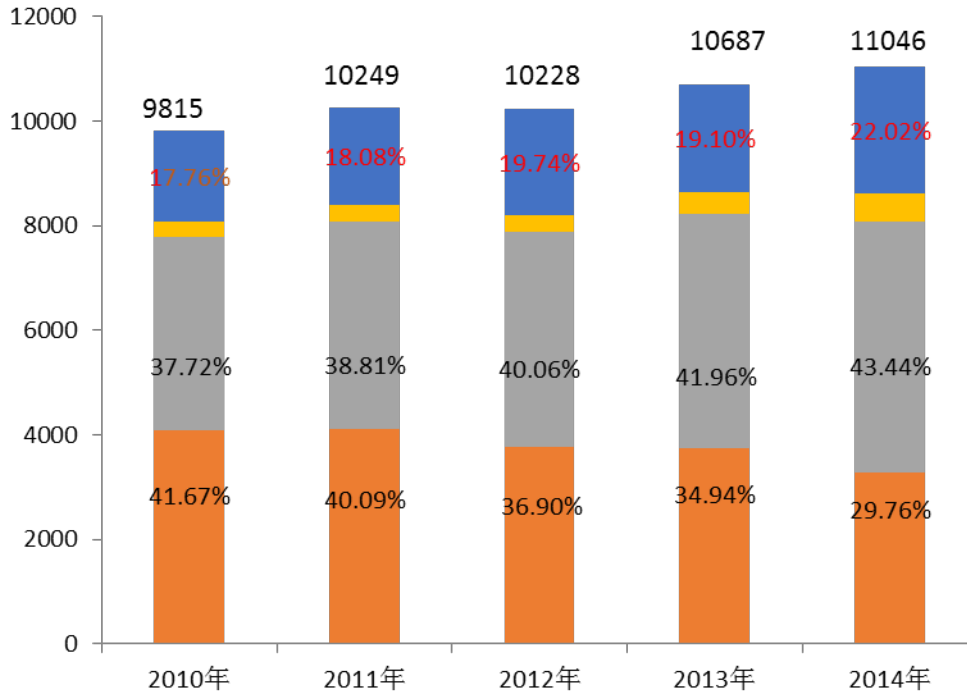




2. □ □ □ □ □ □ □

The Trend of Emission

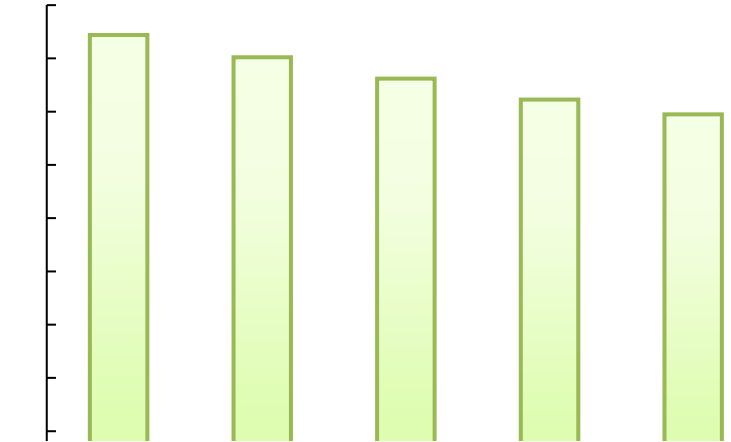
The emission from coal consumption is decreasing by year. The emission from oil consumption and purchased electricity is increasing.



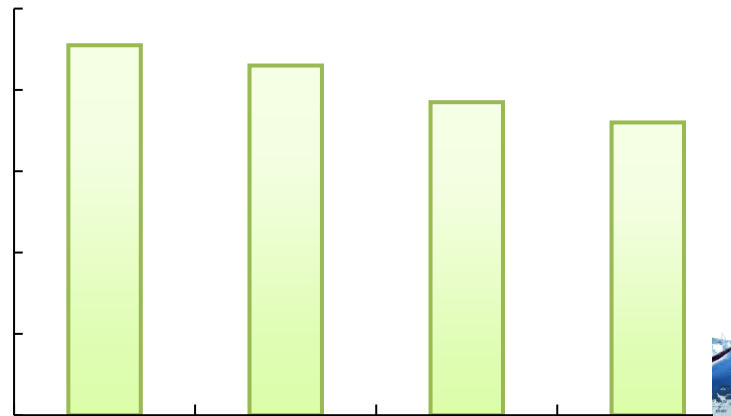
UNIT:
10thousand
ton

Coal Oil
Nature Gas Purchased power

➤ Per Unit GDP energy consumption decreased year by year (tce/10 thousand Yuan)



➤ Per Unit GDP CO2 emission decreased year by year (ton/10 thousand Yuan)



3. □ □ □ □ □ □ □ □ □
Accomplishment of The Set Targets

Indicators	Target 2015 of	Implementation			Accomplishment
		2010	2015	Change	
Per Unit GDP energy consumption	decrease 19.5% compared to 2010	0.42tce	0.33tce	Decrease 21.01%	overfulfill
Per Unit GDP CO2 emission	decrease 23% compared to 2010	0.91ton	0.69ton (2014)	Decrease 24.5%	Fulfill one year earlier
Forest coverage	42%	41.4%	42.03%	Increase about 1%	fulfill





Low-carbon Strategy

系统推进 因地制宜 政府支持 民众参与

1. □ □ □ □ □ □ □ □ □ □ □ □ □ □

成立广州市节能减排及低碳经济发展领导小组，市长任组长

Establish low-carbon development governance mechanisms,
including coordinating body and implementing body etc.

2. □ □ □ □ □ □ □ □ □ □ □ □ □ □

➤ 广州市生态文明建设规划纲要/广州市“十三五”节能降碳规划/广州市节能环保产业发展规划
(2014-2020) /广州市温室气体排放清单及广州市能源消费、二氧化碳排放总量峰值控制途径

Addressing climate change and low carbon development planning-
making/ GHG inventory / Energy consumption and emission
peak controlling/ Eco-civilization Construction Mechanism



Low-carbon development state

- Vigorously develop modern service industry
- Upgrade the industrial sectors to Low carbonization
- Push the development of Strategic new industry

- Intensify new-built building energy efficiency standards
- Improve the share of green buildings
- Upgrade the transformation of existing buildings
- Improve the RE energy usage in the buildings

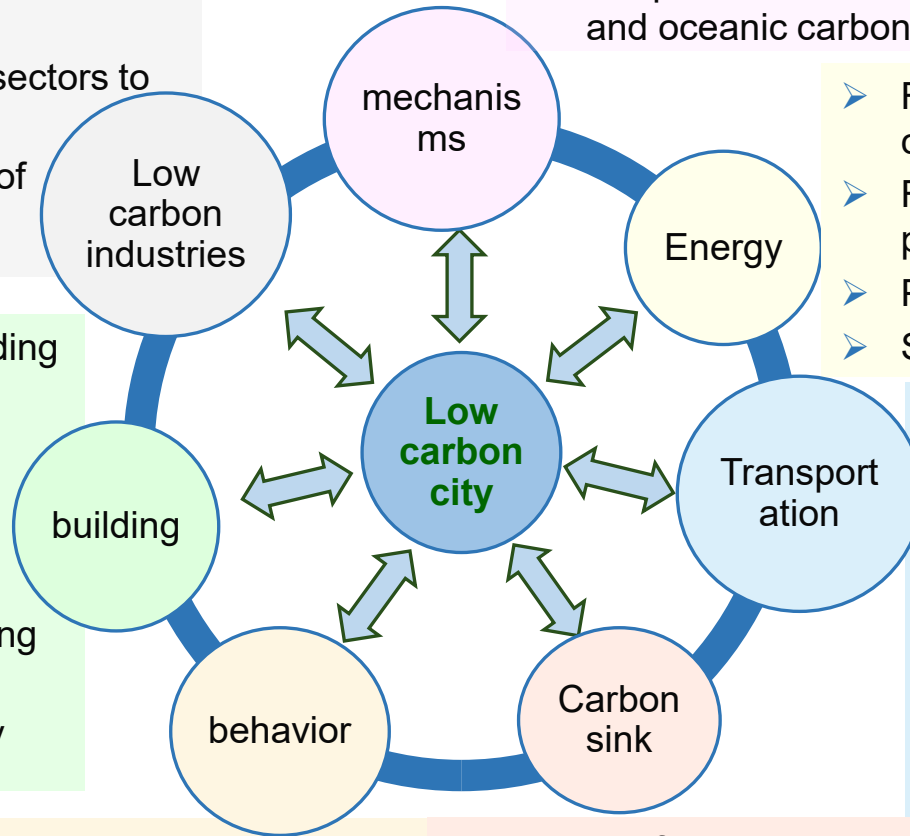
- Build green public institution
- Build low carbon communities
- Limit the excessive packaging of goods
- Advocate low carbon understanding

- Pilot the carbon trade mechanisms
- Pilot the carbon GSP (Generalized System of Preferences)
- Adopt offset mechanisms of forest and oceanic carbon sink

- Reduce the coal consumption
- Reform coal-fired power plant
- Promote nature gas
- Support PV development

- Coordinate the transportation plan with city plan and land use plan
- Advocate public transportation
- Improve energy-efficient and new-fuel vehicles
- Improve Slow Mode Transportation

- Develop forestry carbon sinks
- Develop green city
- Afforest city
- Build greenlanes

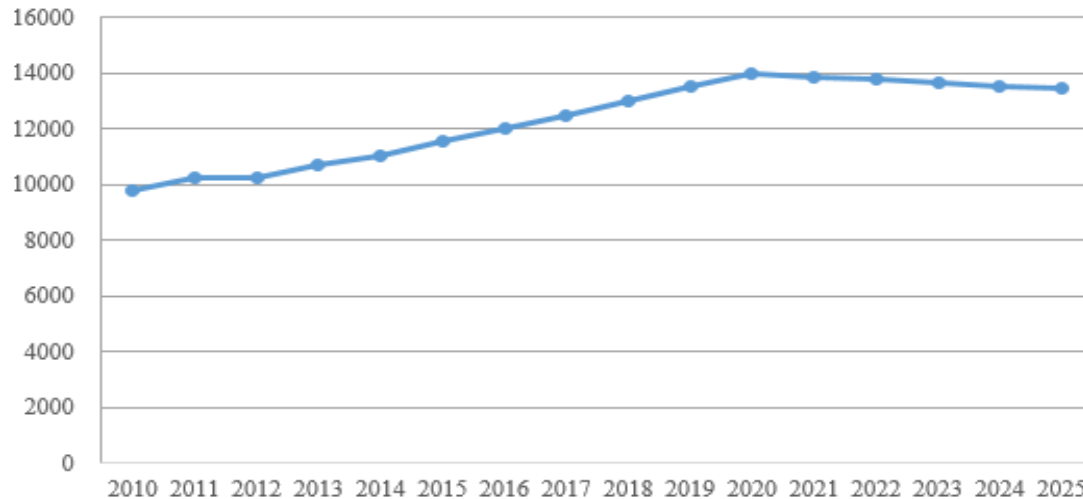


4. □ □ □ □ □ □ □ □ □ □

Setting GHG emission peak goal

Goal: by 2020, Guangzhou will peak its GHG emission

- GDP will be 2800billion with annual increase of 7.5%
- Population will be 15.50 million, GDP per capita 180 thousand
- Total energy consumption will be less than 70million tce
- Coal consumption will be less than 14million tce
- 碳排放总量将达到1.4亿吨二氧化碳左右



Guangzhou emissions by year (10 thousand ton of CO₂ equivalent)

Major practices

to optimize energy structure

to optimize industrial structure

To improve energy efficiency

To implement total energy consumption control





Implementation and Effects of low carbon development

Performances	Implementation	Details
to optimize industrial structure	yes	The ratio of tertiary Industrial Structure increases to 66.77% by 2015 from 61.01% by 2010. To eliminate outdated industrial capacity. To optimize internal industrial structure and upgrade manufacturing sector to low carbonization
to optimize energy structure	yes	(1) to implement total coal consumption control (2) to reform coal-fired power plants; (3) to adopt nature gas usage; (4) to encourage utilization of PV
To improve energy efficiency	yes	(1) strengthen energy audit; (2) strengthen energy-intensive enterprises energy management; (3) eliminate outdated energy equipments; 4) develop circular economics
Low carbon building	yes	(1) strengthen new-built building standard; (2) develop green building; (3) refurbish existing building; (4) adopt RE usage in building; (5) advocate rooftop garden; (6) establish local tech. standards
Low carbon transportation	yes	➤ (1) develop public transportation; (2) Improve energy-efficient and new-fuel vehicles; (3) Improve Slow Mode Transportation





Implementation and Effects of low carbon development

Performances	Implementation	Details
Waste treatment	yes	(1) Building a resource recycling network; (2) Enhancing waste-sorting, collection and delivery; (3) Fasting constructing the garbage treatment facilities; (4) Innovate the financial mechanism in waste treatment sector; (5) Implementing cleaner production
Low carbon behavior and consumption model	yes	(1) Build green public institution; (2) Build low carbon communities; (3) Limit the excessive packaging of goods; (4) Advocate low carbon understanding
to develop forestry carbon sinks	yes	(1) Develop forestry carbon sinks; (2) Develop green city; (3) Afforest city; (4) Build green lanes; (5) Strengthen building legislation and regulation systems





Capacity Building

Performances	status	details
GHG inventory	yes	Complete 2010-2013 inventory for Guangzhou
GHG data statistics and verification mechanisms	On going	GHG data statistics and verification by year
GHG data reporting mechanisms	yes	58 enterprises included in first national GHG reporting list report and verify their emission data
GHG emission reduction target responsibility system and implementation	yes	Allocate the energy intensity reduction target and carbon intensity reduction target to each district
Incentive mechanisms and market-oriented mechanisms	On going	Pilot the carbon trade mechanisms and the carbon GSP (Generalized System of Preferences)
Pilot low carbon industrial zones and communities	yes	Build the first 6 low carbon pilot industrial zones and communities



Mechanism Innovation

Descriptions

Implementation effects

Fundamental research

- Low carbon city strategy

- 编制广州市2010-2013年度温室气体排放清单
- 开展广州市二氧化碳排放峰值及达峰控制途径研究

Mechanisms

- Ø Special fund
- Ø Pilot carbon trade mechanism
- Ø Pilot GSP mechanism
- Ø Plan city Eco-civilization

- Ø 节能专项资金（每年6000万元）
- Ø 战略性新兴产业发展专项资金（每年20亿元）
- Ø 2012年9月11日广州碳排放权交易所挂牌成立
- Ø 列入省首批碳普惠制试点城市
- Ø 制定建筑和交通领域开展碳普惠试点工作的实施方案
- Ø 以天河智慧城大观生态湿地公园试点实施海绵城市建设

Energy sector

- Less coal consumption
- Upgrade coal-fired power plant
- More use of nature gas
- More PV

- 淘汰高污染燃料锅炉1298台
- 8家企业、总装机容量约463万千瓦的21台机组完成改造
- 建成天然气管网7943.76公里，天然气电厂2座
- 分布式光伏发电项目总规模达150兆瓦
- 太阳能集热板安装面积超过40万平方米
- 对太阳能光伏发电项目按照每瓦0.3-0.4元进行补贴

Industrial sector

- Ø to optimize industrial structure
- Ø To eliminate outdated production capacities
- Ø Frost new strategic industries
- Ø Strengthen energy audit

- Ø 2015年三次产业结构1.26 : 31.97 : 66.77
- Ø 关闭搬迁市区314家高耗能高污染工业企业
- Ø 六大高耗能行业产值占规模以上工业总产值比例下降为26.7%
- Ø 2015年战略性新兴产业增加值占GDP比重超过10%
- Ø 高新技术产品产值占工业比重达45%
- Ø 159家国家万企2011-2014年累计节能量达363万吨标准煤
- Ø 2014-2015年共完成197万千瓦电机及电机系统节能改造

Descriptions

Implementation effects

Building sector

- Intensify new-built building energy efficiency standards
- Improve the share of green buildings
- Upgrade the transformation of existing buildings
- Improve the RE energy usage in the buildings

- 新建建筑节能强制性标准执行率达到100%
- 建立了本地化技术路线和技术标准体系
- 累计获得绿色建筑评价标识项目176个，30个项目获得国家三星级绿色建筑评价标识，5个项目获得全国绿色建筑创新奖
- 推进既有建筑绿色化改造，实现既有居住建筑节能改造制度化
- 实施101栋公共建筑的能源审计和能耗数据实时监测

Transportation

- Ø Advocate public transportation
- Ø Improve energy-efficient and new-fuel vehicles
- Ø Implement Quantity Control for Small Passenger Cars

- Ø 市区公共交通出行占机动化出行比例达60%
- Ø 地铁通车9条266公里，公交分担比例达40%
- Ø BRT专用道全长22.5公里，被评定为“金牌标准”的BRT系统
- Ø 列入国家节能与新能源汽车示范推广试点城市
- Ø 累计推广新能源汽车1.46万辆，公交领域应用6268辆新能源车辆
- Ø 新能源汽车可直接上牌，节能车单独摇号
- Ø 建成116个公共自行车服务点，投入公共自行车8850辆

behavior

- Enhancing waste-sorting, collection and delivery
- Fastening constructing the garbage treatment facilities
- Innovate the financial mechanism in waste treatment sector

- 成功创建全国首批生活垃圾分类示范城市
- 垃圾分类处理项目获得了“2015中国城市可持续发展范例奖”
- 列入国家第三批餐厨废弃物资源化利用和无害化处理试点
- 第一资源热力电厂二分厂城市固体废物环境教育项目获2014年中国人居环境范例奖
- 2个项目已成功通过BOT招标引入民营投资者





cases analysis

1、Haizhu Island Circular New Tram

(began operation on Dec. 31, 2014 with total 7.7 kilometers and 11 stations)



➤ **Advanced Tech.:** 首创超级电容储能制式，无接架空触网供电，车辆到站30秒内充电完全，2.5-4公里强续航能力

➤ **Lower energy consumption:** 2.75千瓦时/列公里，制动系统反馈的85%以上能量被超级电容再次吸收利用

➤ **Less CO₂ emission:** 2000 ton CO₂/year emission less than LPG public bus

➤ **Green and Environment friendly:** no tail gas emission, no noise, green theme propaganda





2、Indemnificatory housing with 100% of green building



- **full scale operation** : 2012年2月10日以后取得建设工程规划许可证的保障性住房全部按照绿色建筑标准进行建设
- **Green building evaluation label**: over 1.39 million m² indemnificatory houses were labelling green building
- **National green building demonstration project by MOHURD** : Huangchun Garden Project





3、Enhancing waste-sorting, recycling and treatment



➤ **Whole process management** : 源头减量、分类投放、分类收集、分类运输、分类处置及全过程监管

➤ **Fix time and location**: 实行“定时定点”分类投放的社区达953个

➤ **Resources recycling**: 一街一镇一示范点，鼓励企业参与

➤ **Infrastructure**: 建设资源热力电厂和餐厨垃圾处理厂

➤ **National household waste sorting demonstrating city**

➤ **UN “China sustainable urban development China's Sustainable Urban development award 2015”**





4、Pilot the carbon Generalized System of Preferences (GSP)



❖ Encourage low carbon behaviors:

- Purchase green building
- Low carbon travelling
- Save water, gas and electricity

❖ Incentive methods:

- Merchants discount
- Government public service
- Financial incentives





Experience Sharing

- ❖ 一是推动能源结构低碳化。推动煤炭减量化，大力淘汰小锅炉，推动中心城区无煤化。2014年煤炭消费产生的二氧化碳排放量比2010年减少802.85万吨。
- ❖ 二是推动建筑绿色低碳化。在财政投资项目、旧城改造项目、城市发展新区、大型公共建筑推广绿色建筑标准，研究推广本地化绿色节能适宜技术，建设岭南特色绿色建筑。
- ❖ 三是打造低碳交通体系。坚持公交优先，限制私人交通发展，大力发展地铁、有轨电车、新能源公交车等低碳公交。
- ❖ 四是提高废弃物综合利用率。开展生活垃圾分类回收，构建再生资源回收网络，建设生活垃圾焚烧等大型垃圾处理设施。
- ❖ 五是引导低碳生活和消费。通过阶梯电价、气价、水价等促进生活节能，限制商品包装和一次性商品使用，探索开展碳普惠制。

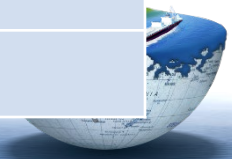




Investment Projects

1. The projects most contributed to emissions peak and low carbon development

领域	项目名	建设内容	投资额 (亿元)	年减排量 (万吨CO2)
能源领域	开发区分布式光伏发电规模化应用示范	光伏项目共计60个，总装机容量为230兆瓦，包括“广东粤电广州开发区51.2兆瓦光伏发电项目”国家金太阳示范项目	20	23
	迪森生物质能源产业化项目	年新增生态油2万吨，生物质成型燃料100万吨，改造1500蒸吨生物质工业锅炉和气化炉	5	131
	智能电网项目	中新广州知识城内智能电网建设	116	
	协鑫永和天然气热电联产项目	建设2*18万千瓦燃气-蒸汽联合循环机组	15	38
	天然气分布式能源站项目	建设中新知识城、珠江新城等天然气分布式能源站（共256兆瓦）	20	27
建筑领域	绿色城区建设示范项目	中新知识城示范项目、大学城二期示范项目、南沙新城示范项目	68	
	既有建筑改造示范项目	节能率超过65%的低能耗建筑示范和超低能耗建筑示范项目	5	
	可再生能源建筑	太阳能、空气能、浅层地能的可再生能源建筑规模化应用	7	
交通领域	新能源汽车推广补贴项目	投入6268辆节能与新能源公交车辆，其中纯电动公交车117辆，插电式LNG混合动力公交车1751辆，非插电式混合动力公交车1684辆，LNG公交车2716辆	36	28
	城市轨道交通建设项目	地铁通车9条266公里，日均客运量超过620万人次		200
资源综合利用领域	李坑综合处理厂	建设日焚烧处理生活垃圾2000吨，发电装机容量为2×25MW的热力发电厂	4	150
	自然村垃圾分拣点	从化市197个自然村各建设一个垃圾收集分拣点，含垃圾收集、分拣功能	0.1	
	万绿达集团资源综合利用示范基地建设	年处理废塑料、废金属、废纸、废渣、报废设备、废旧包装物等各类废物80多万吨，生产再生产品400多种	2	



Investment Projects

2.The investment projects that will push forward next step

Fields	Projects	Details	Investment (100million Yuan)	Emission reduction (10 thousand ton CO2/a)
Energy Sector	PV POWER	到2020年太阳能分布式光伏发电总装机容量达200万千瓦	80	200
	NG projects	2020年天然气年消费量达60亿立方	120	550
Transportati on Sector	Metro-Lines	启动建设15条、里程413.5公里的地铁新线，到2020年开通地铁里程超过520公里	1000	165
	EV and LNG vehicles	80%以上的公交车更换为电动汽车和LNG汽车	80	34
Waste recycling	Recycle of MSW	建成广州市第三、第四、第五、第六、第七资源热力电厂、萝岗生物质综合处理厂、李坑综合处理厂、增城朱村餐厨垃圾处理厂等大型生活垃圾处理站及配套设施	133	1300

About peer review approach

- ❖ Categorizing cities according to different characteristics and evaluating differently
- ❖ Setting key targets and goals
- ❖ Determination of templates of evaluation or standard set of indicators
- ❖ Showing cases of performance under each sectors
- ❖ Combination of qualitative and quantitative assessments
- ❖ Scoring and numerical benchmarks needs data support

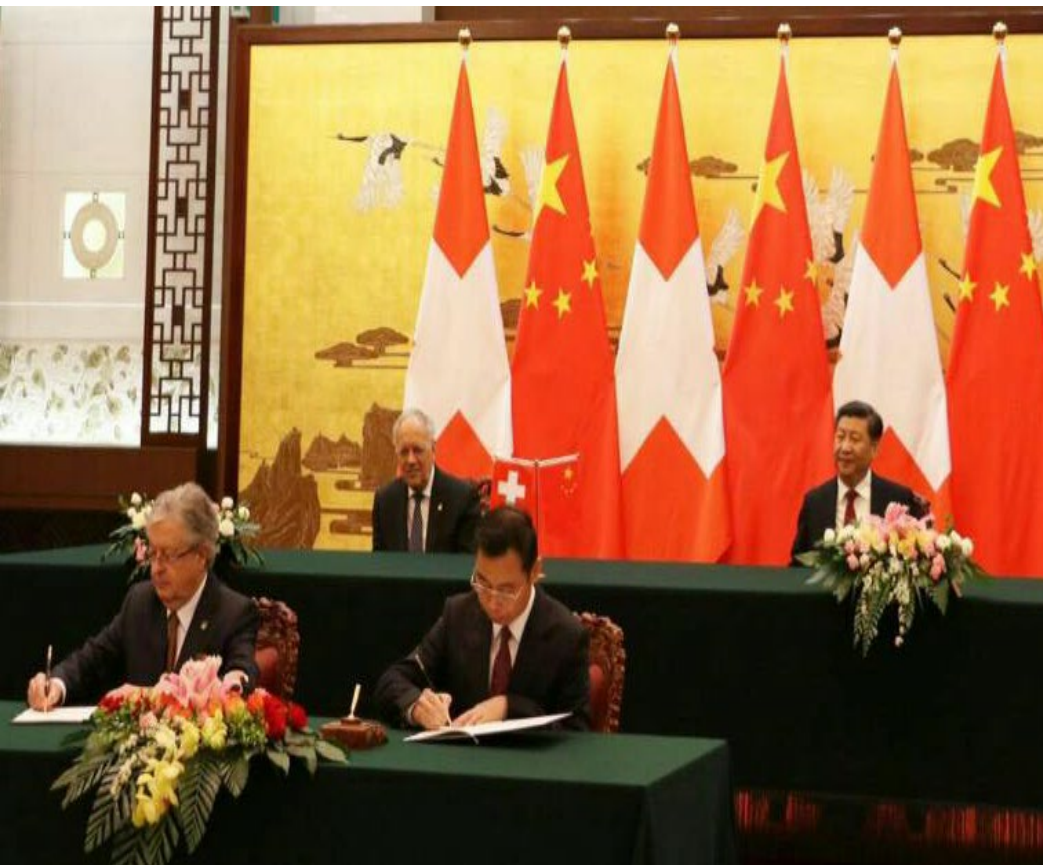


Thank you for your attention

欢迎批评指导



➤开展对外合作和试点示范工作



- 2016年4月8日，**习近平主席和瑞士联邦主席施耐德-阿曼**见证，广州市与瑞士签署《**广州市人民政府与瑞士发展与合作署关于中国-瑞士低碳城市项目合作备忘录**》
- 作为中国-瑞士低碳城市项目的首个示范项目，在广州市从化区设立**中国-瑞士（广州）生态医药健康产业基地**





- 实施能源消费和碳排放总量及强度双控制度，加强考核监督，分解能耗和碳排放量目标任务，以强化倒逼经济和能源的低碳转型
- 深入推进广州市碳普惠制试点工作，建设网站、**APP**、微信等公共信息服务平台
- 明确温室气体排放总量达峰路径并组织实施





➤ 工作建议

- 将温室气体排放纳入统计核算体系。建议国家将温室气体排放有关数据和指标纳入统计核算体系，尽快出台统计核算办法。
- 实施和推广低碳认证制度。从家电、照明、数码产品等开始，逐步推广实施产品碳标签，鼓励消费者和生产者购买和生产低碳产品，增强对应对气候变化的认识。
- 深化体制机制创新。建议国家在体制机制创新方面给予更多的政策空间。



