



Up-scaling and mainstreaming sustainable
building practices in western China
在中国西部，生态建筑的规模不断扩大，逐渐成为
主流建筑。

Sustainable Building Development in Europe

欧洲的可持续建筑发展历程

A policy perspective政策视角

Felix Suerkemper

Project Co-ordinator

项目主管

Research Group Energy, Transport and Climate Policy

能源、交通与气候政策研究小组

Wuppertal Institute for Climate, Environment and Energy Germany

德国伍珀塔尔气候、环境、能源研究所

SusBuild Kick-Off Meeting

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SusBuild启动会议

中国重庆2016年4月12—13日

Energy efficiency improvement:

Key for securing energy supply and mitigating climate change

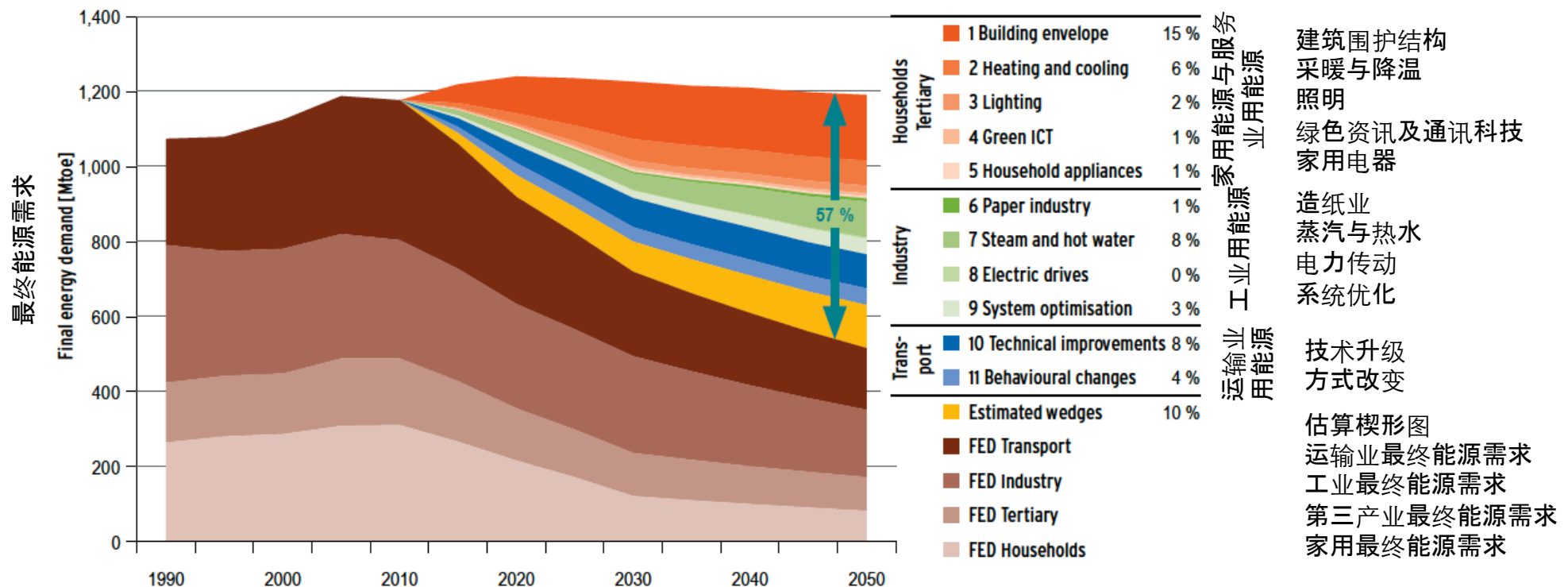
提高能效：保障能源供给与缓解气候变化的关键要素

Energy Demand and saving potentials in EU by 2050:

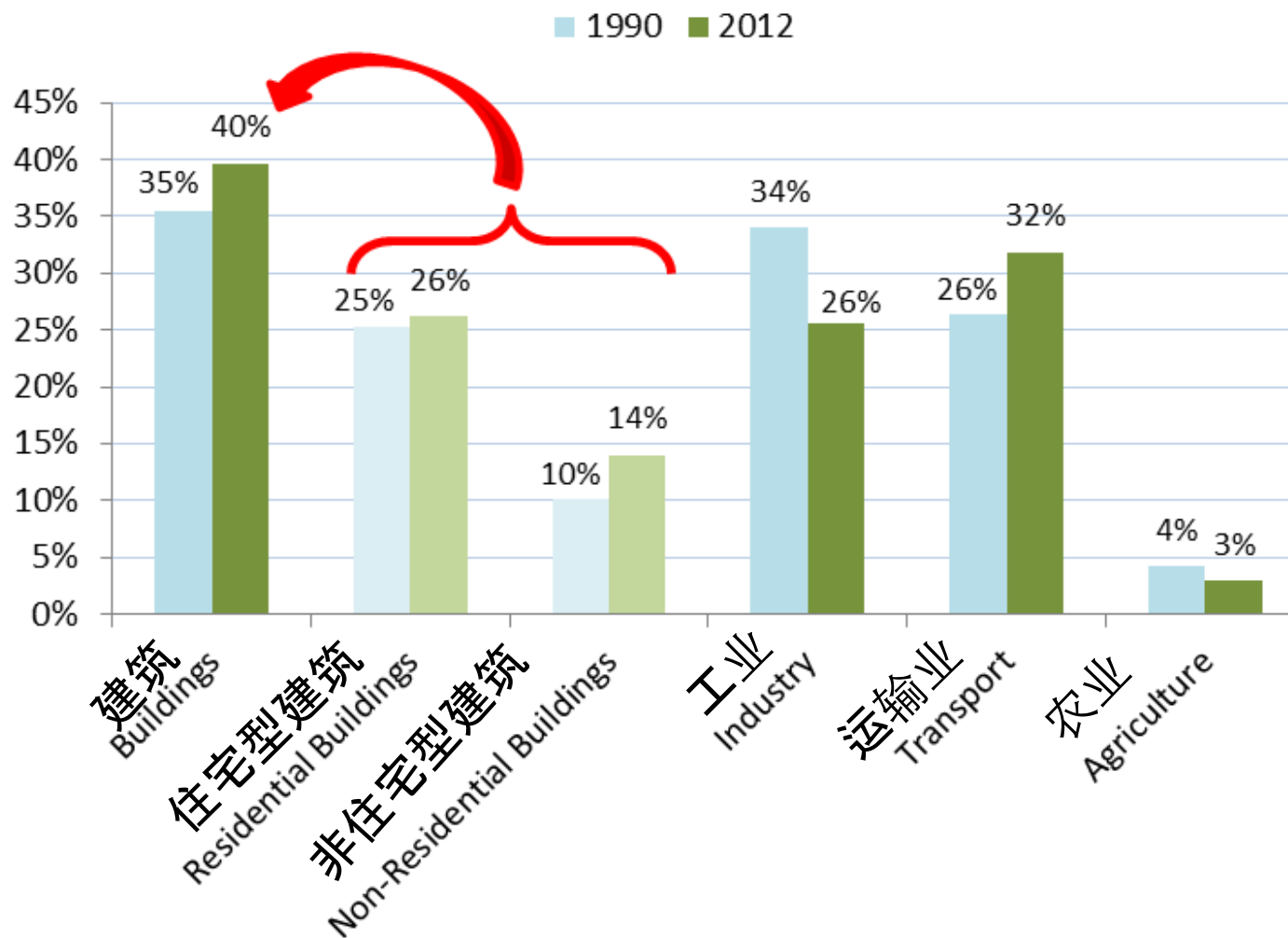
到2050年，欧盟的能源需求与节能潜力

➤ 57% on final energy 最终能源节约57%

➤ worth €500 bn per year in 2050 在2050年，节能量等于创造5000亿欧元的价值



Share of buildings in final energy consumption in EU-28 欧盟28国各国的建筑最终能源消耗所占比重



Source: EEFIG (2015) based on Eurostat data
数据来源: EEFIG (2015) (基于欧盟统计局数据)

European countries 欧洲国家

- recognition of the high relevance of energy saving issues in the wake of the energy crisis of the 1970s. 在20世纪70年代发生能源危机之后，人们认识到节能问题与能源危机的紧密关系。
- development of a set of legislative frameworks with regard to energy efficiency enhancement and reduction of C O₂ emissions 编制一套关于提升能效与减排的立法框架。

Very intensive development in the last years in all of Europe **过去几年，整个欧洲的节能建筑迎来高速发展**

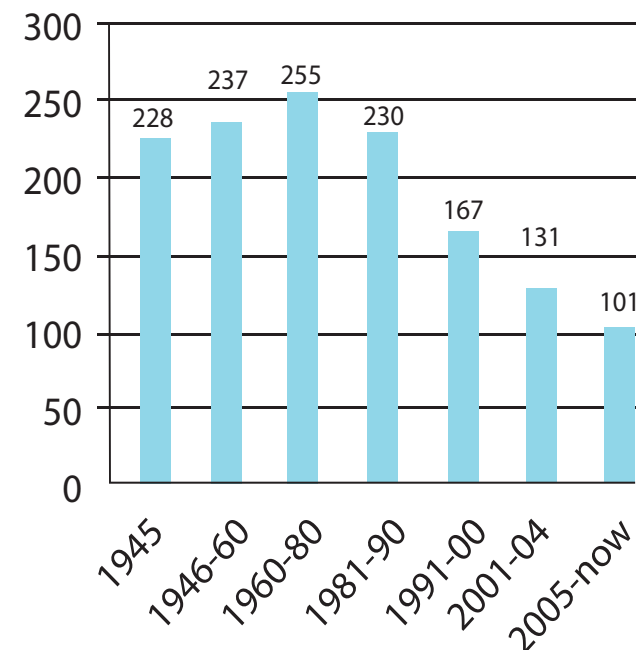
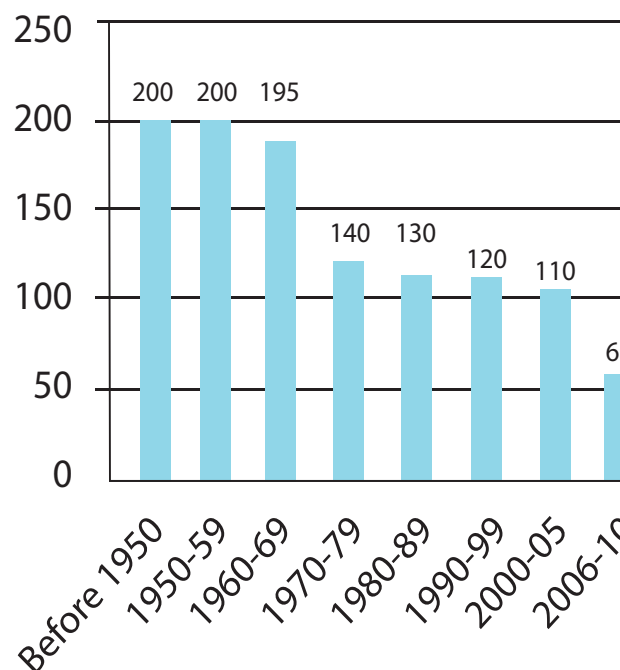
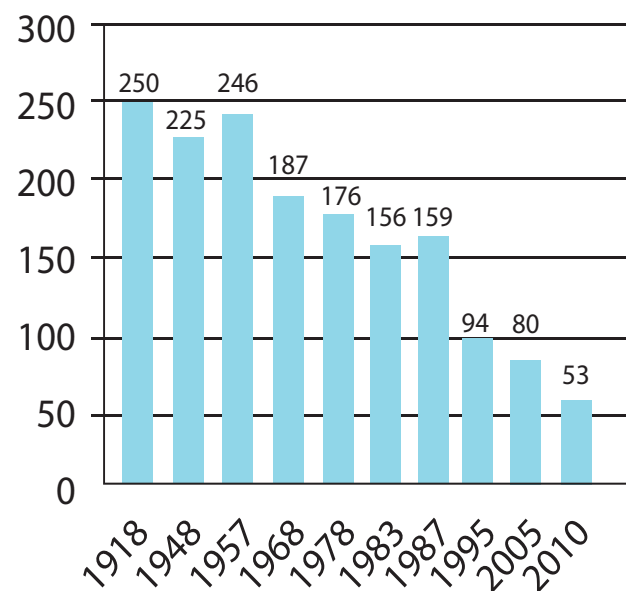
- Energy performance, ultra low energy, passive design and nearly zero energy or even plus-energy buildings on the agenda
把能效，超低能耗、被动式设计与近零能耗建筑或甚至正能耗建筑提上议程。
- All countries have agreed that all new buildings should move fast towards nearly zero energy consumption
各国均认可所有新建筑应快速向近零能耗建筑迈进。
- Many of these new initiatives take place at the European level, but have to be implemented at a national level, sometimes involving the local level
虽然在欧洲层面上制定了众多上述计划，但还须在国家层面上实施，甚至有时需要在地方层面上付诸实施。

Building energy consumption in Europe

Average final consumption levels for heating (kWh/(m2a)) of single family homes by construction year

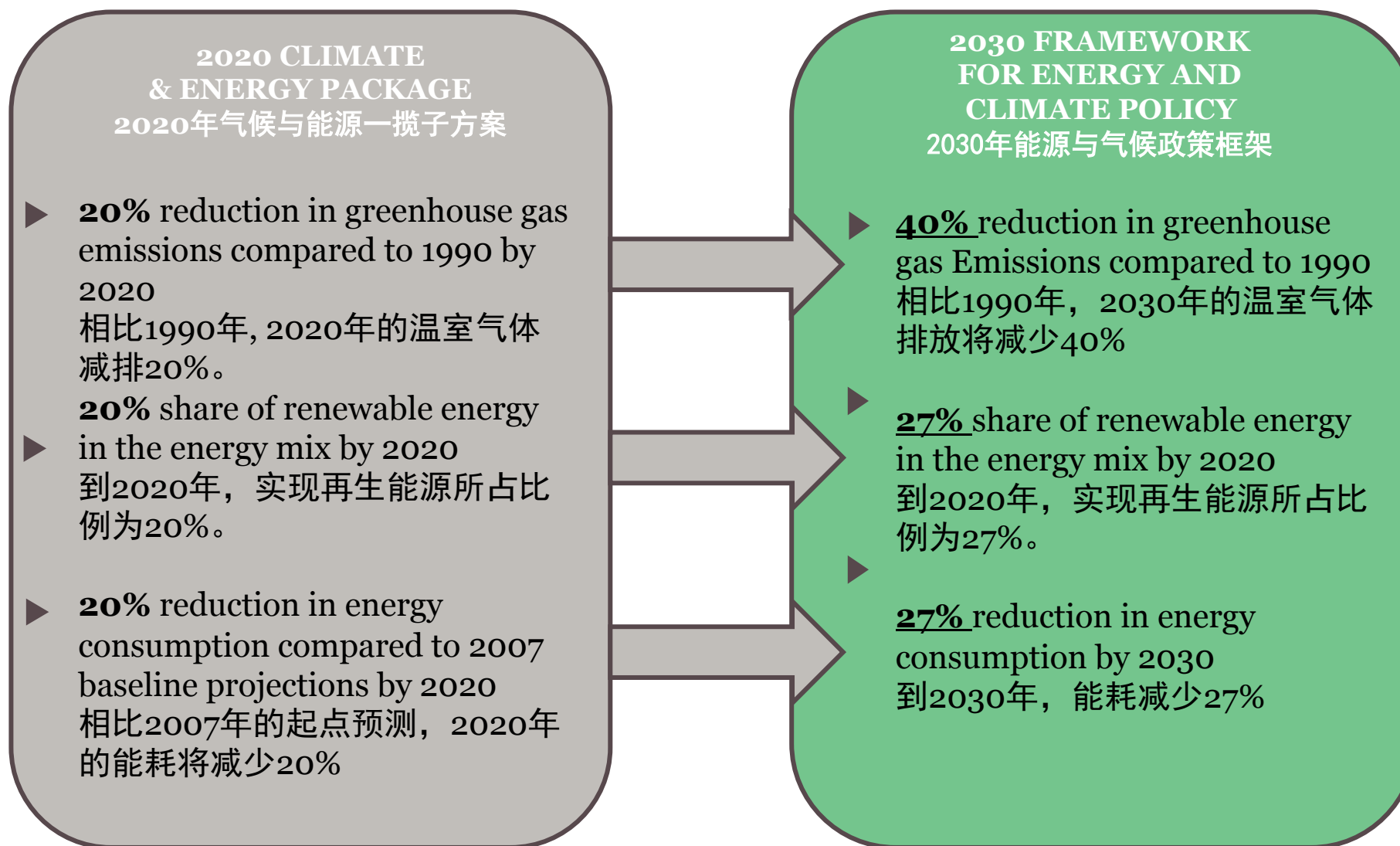
欧洲的建筑能源消耗情况

按建设年的单栋住宅楼用于取暖的平均最终能耗水平(kWh/(m2年))



Source: BPiE (2011)

数据来源: 策略与地区合作伙伴部 (2011)



EU policy framework for energy efficiency

Energy Performance of Buildings Directive (EPBD)

欧盟能源效率政策框架

Energy Performance of Buildings Directive

建筑能效指令

- › all new buildings must be (nearly) zero energy buildings in Europe by end of 2020 (public buildings by end of 2018)
截止2020年底，欧洲所有新建筑必须为近零能耗建筑（截止2018年底，公共建筑必须为近零能耗建筑）
- › end of 2020: minimum energy performance requirements in case of renovation
截止2020年底：改造后的建筑须达到最低能源效能要求
- › energy performance certificates when selling or renting buildings
出售或出租房屋时，须持有能效证书
- › regular inspection of boilers and air conditioners, etc.
定期检查热水器与空调等设备。



EU policy framework for energy efficiency

EcoDesign & Energy Labelling Directives

欧盟能源效率政策框架

EED、生态设计与能效标识指令

Energy Efficiency Directive (EED)

能源效率指令(EED)

- requirement for MSs to develop national building renovation strategies or roadmaps
成员国编制国家建筑改造计划的要求
- requirement for MSs to renovate 3% of the total floor area of buildings owned and occupied by central governments
成员国改造3%的中央政府所有与使用的建筑楼面面积的要求。

EcoDesign and Labelling Directives

生态设计与能效标识指令

- minimum EE requirements and labelling for energy-related products such as boilers, household appliances, lighting etc.
能源相关产品的最低节能要求与标识，比如热水器、家用电器、照明设备等等。



Financial instruments to promote highly efficient buildings in the EU

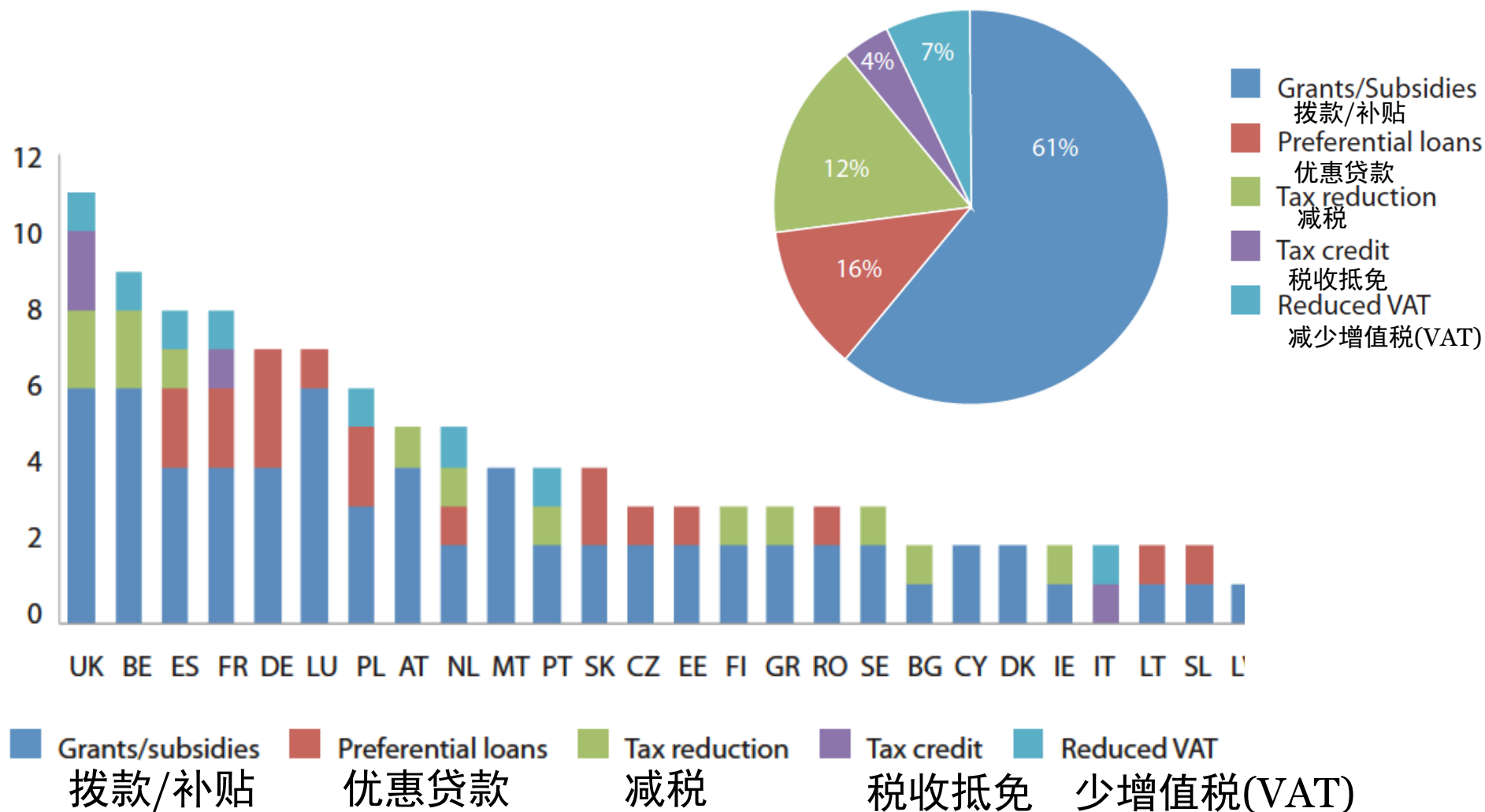


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Number of financial instruments in place in 2011 by country and share of financial instruments in EU

在欧洲推广节能建筑的激励政策

于2011年，各国落实的激励政策数量以及各政策所占比例。



Good Practice Example

Energy Saving Partnership

德国最佳实践：柏林节能伙伴

Performance Contracting

Energy Saving Partnership

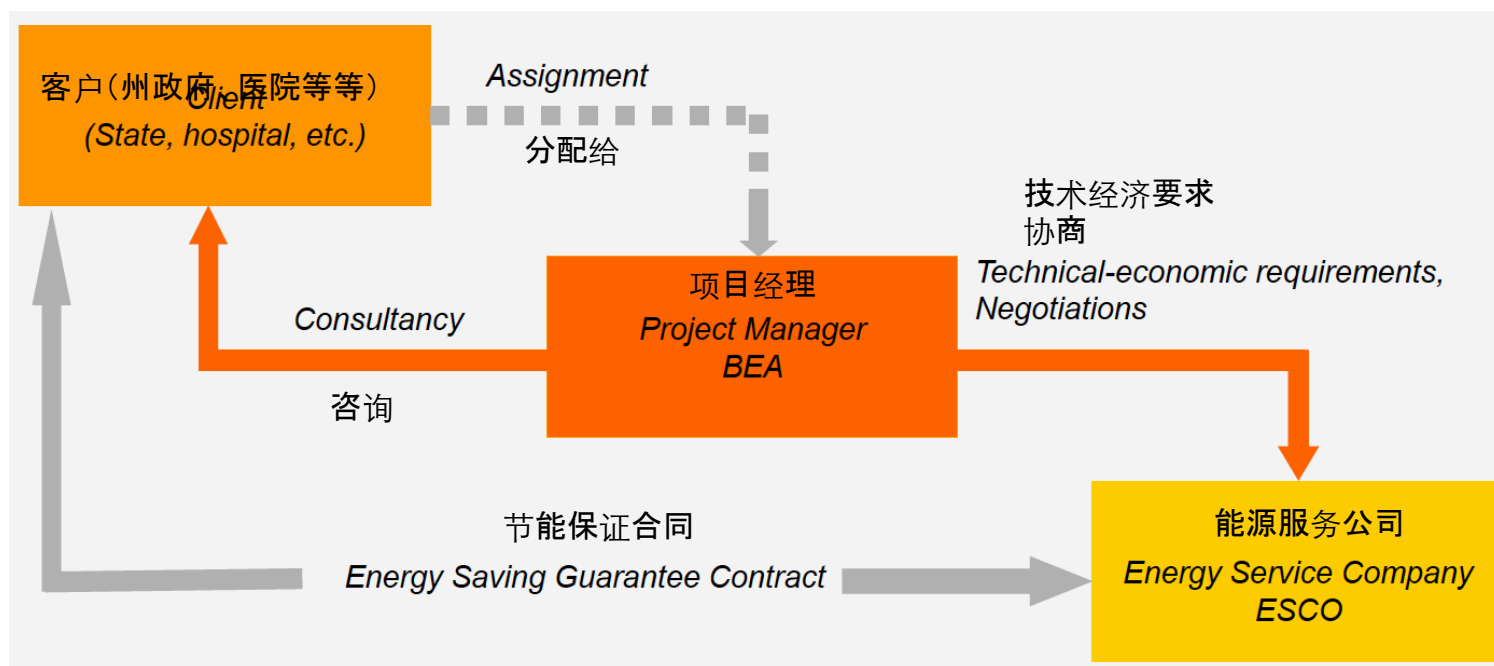
A Berlin Success Model

柏林的成功模式



Background 背景

- ▶ Energy Saving Partnership (ESP): Energy Performance Contracting (EPC) for public buildings in Berlin
节能伙伴（ESP）：柏林公共建筑节能改造合同能源（EPS）
- ▶ 1992 initiated as Public-Private-Partnership to reach ambitious climate protection targets
以公私合营形式成立于1992年，旨在实现保护气候的远大目标。
- ▶ Coordination by BEA & Senate of Berlin; strong political back-up e.g. by parliamentary groups
由柏林能源署与柏林参议院牵头；得到政府的大力支持，比如得到议会的大力支持。
- ▶ Project management by Berliner Energieagentur 由柏林能源署负责项目管理
- ▶ Shareholders: Federal State of Berlin, Vattenfall Europe, GASAG, KfW Banking Group
股东：柏林联邦州、瓦腾福电力公司（欧洲）、GASAG、德国复兴银行集团



Performance Contracting

Energy Saving Partnership

A Berlin Success Model

Key figures 关键数字

- Number of pools/contracts: 26; about 1,400 buildings
捆绑合同数量/合同数量：26； 大约1400栋建筑
- Guaranteed Savings (all contracts): about 11.7 mio. €/a
保证节能收益（所有合同）： 大约1170万 /年
- Share of Berlin (savings on public budget): about 2.7 mio. €/a
柏林份额（财政预算收益）： 大约2.7 mio. €/a
- CO₂ reduction: 70,000 t/a, about 500,000 t
CO₂减排： 70,000 t/年, 大约500,000 t
- Investments (all pools/contracts): 51.6 mio. €
投资额（所有捆绑合同/合同金额）： 51.6 mio. €
- Clients: public authorities (75%), hospitals (20%), trade, commerce, housing associations (5%)
客户： 公共机构 (75%), 医院 (20%), 贸易, 商务, 建筑协会 (5%)

- **Pool:** 69 buildings (schools, kindergarten, gyms)
捆绑合同：69栋建筑，包括学校、幼儿园与体育馆
- **Total investment:** ca. 2.8 Mio. €
总投资：ca. 280万欧元
- **Duration of contract:** 14 years
合同周期：14年
- **Measures:**
措施
 - New boilers in 11 buildings 在11栋建筑安装新加热器
 - switch from coal/heat oil to gas
将能源从煤/石油转成天然气
 - building automation 建筑自动化
 - modernisation of lighting 照明设备现代化
 - renewables, e.g. solar thermal systems
再生能源技术，比如太阳热水系统
- **Baseline:** 1.84 Mio. €/a
起点：184 万欧元/年
- **Guaranteed energy cost savings:** 29.4 % = 541,679 €/a
保证节能收益：29.4 % = 541,679 €/a
- **CO₂ reduction :** 3,973 t/a
CO₂减排：3,973 t/a



Source: BEA 2013
资料来源：BEA 2013

Energy Saving Partnership was the right way to improve EE in Berlin public buildings 成立节能合作伙伴是提高柏林公共建筑节能水平的正确途径

- Local authorities would not be able to substantially invest in building EE if they had to rely only on own financial resources
若必须依靠当地政府自身的财政资源的话，那么当地政府无法大量投资节能建筑。
- contractual saving guarantee a convincing argument for the authorities
以合同能源形式保证节能收益能赢得政府的信任。
- local budget situation: improves and contributes to consolidating the public financial budget in a sustainable way
当地政府的预算情况：改善，可持续地巩固公共财政预算
- improved the maintenance situation of public buildings
巩固建筑维护条件

Implementation is supported by 成功因素：

- political will of local government 当地政府的意愿
- a strong and reliable legal framework for tenders and Energy Performance Contracts
具备大力支持投标企业与合同能源的可靠法律框架
- standardised procedures and model contracts, clear tender procedures together with professional process management
标准的流程与合同、明确的投标流程、专业的流程管理
- pooling of buildings with different conditions encouraged EE investments in large building complexes and reduced transaction costs
将不同形式的建筑捆绑在一起有利于鼓励节能资金投入到大型综合体，并减少交易成本。

Thank you for your attention

felix.suerkemper@wupperinst.org