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Energy solutions
for a changing world

Key Lessons About Market-Based Mechanisms

市场机制的主要经验教训

**Workshop on Market Mechanisms to Support
China's Energy and Climate Goals**
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The Regulatory Assistance Project

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European Union

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Steps to Reducing Energy Use

减少能源使用的步骤

- Reducing energy use in a jurisdiction through an energy cap or target involves three steps:
 - **setting the level** of the cap or target
 - **placing obligations** on parties subject to the cap or target
 - **implementing** the cap or target
- 在某辖区内通过能源总量限制或目标的方式，减少能源使用，共分三个步骤：
 - **设定**限制或目标的**水平**
 - **规定**遵守限制或目标相关方的**义务**
 - **实施**限制或目标

Setting Energy Caps or Targets

设定能源总量限制或目标

- The Government establishes a cap or target on energy use in one or more sectors of the economy (eg electricity sector, industrial sector, etc)
- The cap or target can be set in terms of **energy** (kWh) or **emissions reductions** (tCO₂-e)
- Sometimes the cap or target may be set in terms of **energy intensity** (kWh/GDP) or **emissions intensity** (tCO₂-e/GDP)
- 政府设定一个或多个经济部门（例如电力部门、工业部门等）能源使用的总量限制或目标
- 可根据**能源**（千瓦时）或**排放减量**（吨二氧化碳当量）设定限制或目标
- 有时也可根据**能源强度**（kWh/GDP）或**排放强度**（tCO₂-e/GDP）设定限制或目标

Placing Obligations (1)

附加责任（1）

- The Government places **obligations** on specified entities (eg energy suppliers, large industrial energy users)
- An obligation requires each **obligated party** to stay within a cap or achieve a target level of:
 - energy used in-house; or
 - energy supplied to customers (kWh); or
 - emissions reductions (tCO₂-e)
- 政府规定特定实体（例如，能源供应商、工业用能大户等）的**责任**
- **责任**可以规定**责任方**将下列方面维持在限制之内或达到某个目标：
 - 内部使用的能源；或
 - 供应给客户的能源（kWh）；或
 - 排放减量(tCO₂-e)

Placing Obligations (2)

附加责任（2）

- **The total of all obligations placed in a jurisdiction equals the value of the jurisdictional cap or target**
- **The level of the obligation (ie the cap or target) placed on an individual entity is often based on that entity's market share of energy used or energy supplied in the jurisdiction**
- 某区域内的所有目标总量相当于该辖区内的限额或目标值
- 单个实体的责任水平（例如限制或目标）通常以该实体在该区域内使用的能源所占的市场份额，或其在该区域内所供应的能源为基础

Implementing an Energy Cap or Target

实施能源总量限制或目标

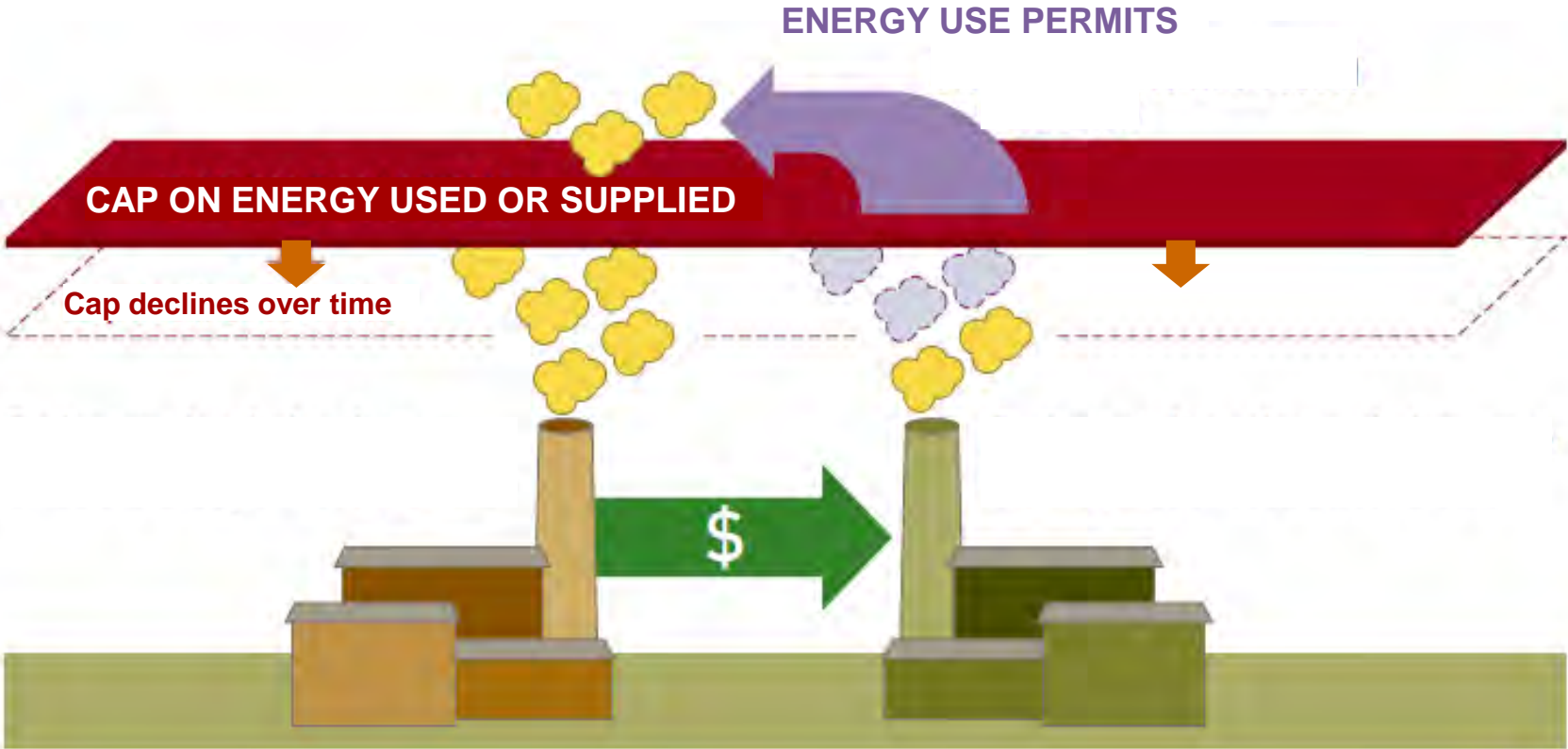
- There are two types of market-based mechanisms that may be used by governments to implement an energy cap or target
 - **permit schemes;**
and
 - **energy efficiency certificate schemes**
- 政府在实施能源总量限制或目标时，有两种市场机制可供采用
 - **许可方案**；以及
 - **能效证书方案**

Permit Schemes (1)

许可方案（1）

- A permit scheme requires all obligated parties to stay within the **cap** placed on the quantity of energy used in-house or supplied to customers by the obligated party
- Obligated parties must obtain a permit for each unit of energy used or supplied
- 许可方案要求所有责任方将内部使用的能源数量或由责任方供应的能源数量维持在所规定的**限制**之内
- 责任方所使用或供应的每一单位能源均须获得许可

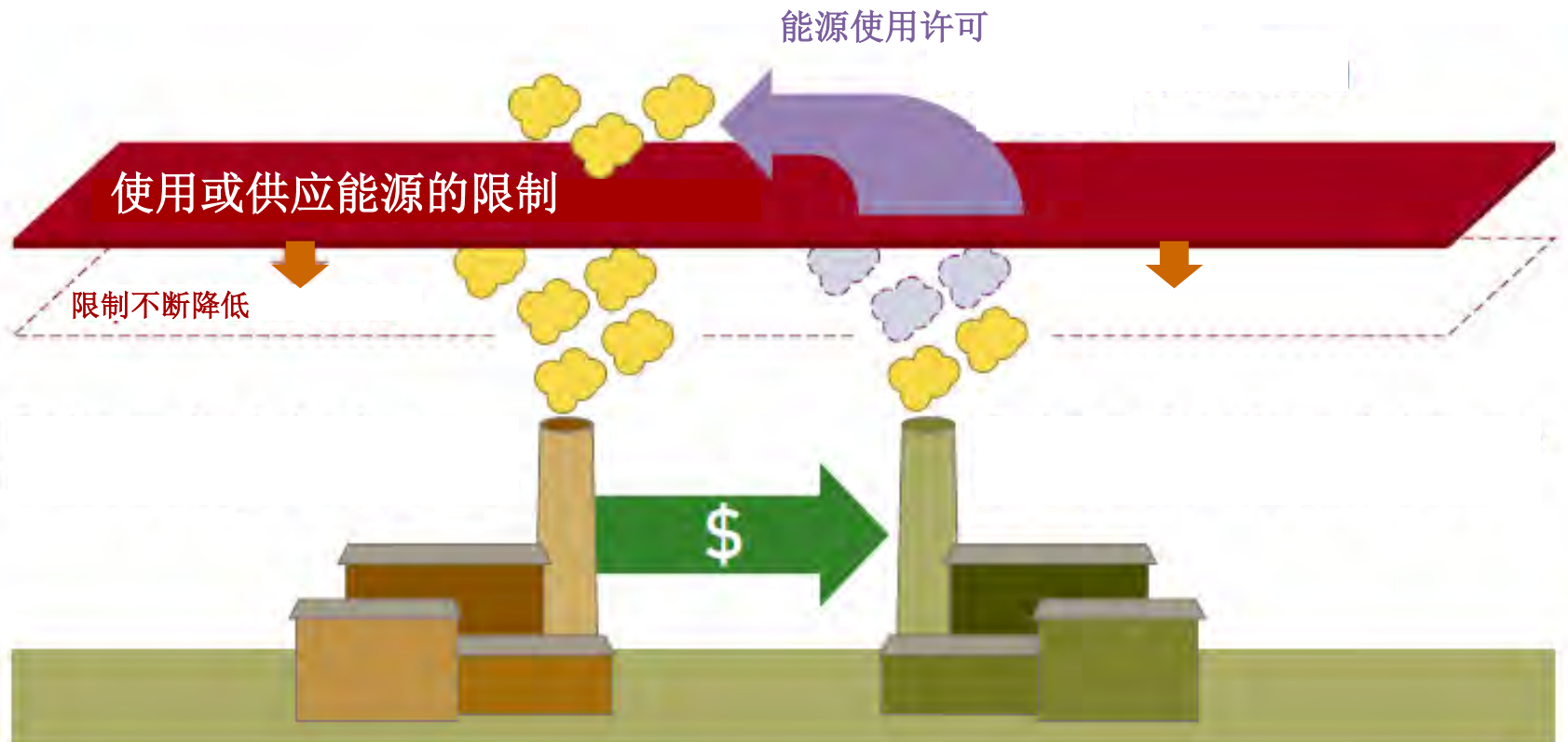
Permit Schemes (2)



Businesses that reduce energy use less than required must buy more permits

Businesses that reduce energy use more than required can sell excess permits

许可方案 (2)



所减少的能源使用低于要求的公司必须购买更多许可

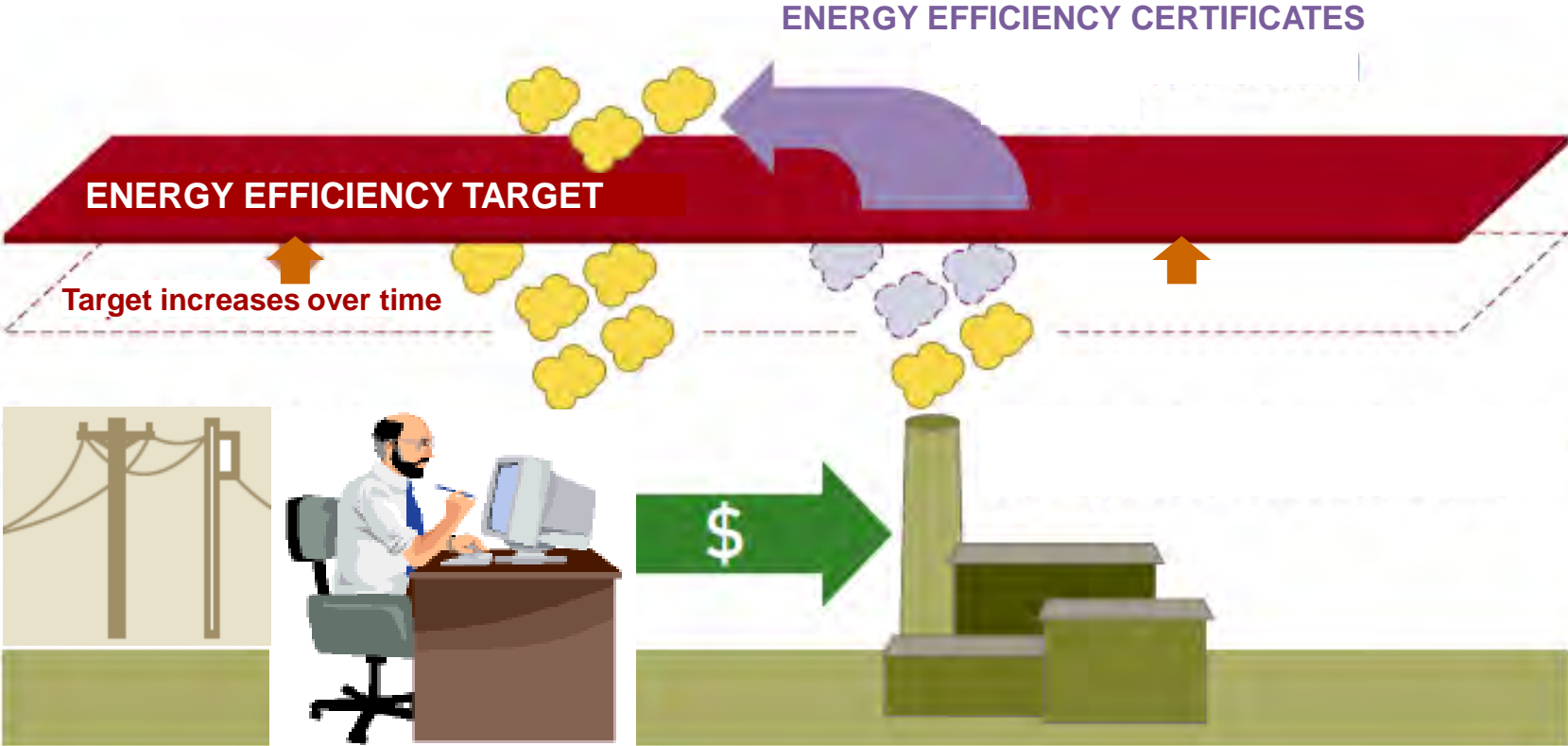
所减少的能源使用超过要求的公司可以出售超出的许可

Energy Efficiency Certificate Schemes (1)

能效证书方案

- An energy efficiency certificate scheme requires obligated parties to achieve an energy efficiency **target**:
 - by reducing the quantity of energy used in-house or supplied to customers; or
 - by buying certificates that represent a specified and verified quantity of energy that has been saved by others
- 能效证书方案要求责任方必须达到能效**目标**:
 - 通过减少内部使用的能源数量或向客户供应的能源数量；或
 - 通过购买证书，证实具体的、经核实的能源数量已由其他方节省

Energy Efficiency Certificate Schemes (2)



Energy suppliers must create or purchase energy efficiency certificates to meet their targets

Businesses that reduce energy use can create and sell energy efficiency certificates

能效证书方案 (2)



能源供应商必须创建或购买能源效率证书，以达到其目标

减少能源使用的企业可以创建和出售能源效率证书

Comparison of Schemes

方案对比

- The two types of schemes have the same objective and achieve the same result – reduced energy use per unit of output
- But the two schemes are different:
 - in how they achieve the result; and
 - in how they are implemented
- 两种方案目标相同，均期望实现相同的结果——减少每单位产出的能源消耗
- 但两种方案又存在区别：
 - 实现结果的方式；以及
 - 如何实施

Key Lessons (1)

主要经验 (1)

- Market-based mechanisms **must be carefully designed and managed** to achieve a desired result
- International experience shows most market-based schemes have had to be modified numerous times to address unanticipated problems
- If secondary market trading is adopted, an agency must be designated and authorized to watch its performance closely and manage it carefully
- 基于市场的机制要得到预期的节能结果，**必须精心设计，加强管理**
- 国际经验表明，大多数机制必须要经过无数次的修正和完善，以应对各种始料不及的问题
- 若采用二级市场的交易制度，必须要指定一个机构，授权其对交易进行密切监督和管理

Key Lessons (2)

主要经验 (2)

- **A clearly defined target or cap is critical**
 - Policymakers often end up adding features that undermine their own cap or simply set the cap too high
 - If a scheme includes secondary market trading, the level of the cap will be the most important factor determining the value of the tradable instrument and the incentive to engage in trading
- 关键是提出**明确的目标或总量**
 - 需要注意的是，政策制定者有时可能会低估或高估总量目标
 - 如果选择通过二级市场交易制度，总量控制水平将成为最重要的因素，决定可交易证书的价值，它的激励作用也直接影响参与交易企业的积极性

Key Lesson (3)

主要经验 (3)

- **Linking** the scheme to **energy efficiency** is essential
 - US RGGI is a good example: auction permits and use revenue for EE
- Relying on price signals alone to reduce energy use and deliver gains in energy efficiency is unrealistic because, to achieve results, these prices will have to be unacceptably high
- 关键是将**市场机制与能效挂钩**
 - 美国东北区排放交易制度（**RGGI**）是个很好的案例：通过拍卖排放许可和合理支配收益提高能效
- 单靠价格信号来减少用能和提高能效是不现实的，将最终导致这些价格高得离谱

Key Lesson (4)

主要经验 (4)

- **Limiting** the initial pilot programs to the **power sector** is a reasonable approach
- No government has yet been successful in designing a single comprehensive market-based mechanism that covers all sectors
- Many governments have initially limited the focus to the power sector (or just a few sectors)
- As policies are fine-tuned, coverage can be broadened
- 合理的做法是，从**电力部门**开始初步试点
- 目前尚未有任何一个国家成功地设计出一个全面的市场机制，能够覆盖所有用能部门
- 很多国家都把电力部门（或少数几个部门）作为初步的重点
- 随着政策的不断调整和完善，可以将政策的覆盖范围不断扩大

Conclusion

总结

- The most successful market-based mechanisms are combined with programs that invest directly in energy efficiency
- **Permit schemes** can “recycle”, or reinvest, revenue from permit sales into cost-effective energy efficiency programs
- **Energy efficiency certificate schemes** achieve this same result more directly by requiring obligated parties to invest in energy efficiency or buy certificates
- 最成功的市场主导型机制是与直接投资能源效率的项目相结合的
- **许可方案**可以将出售许可的收益进行“回收”或再投资，用于符合效益成本的能源效率项目
- **能源效率证书方案**通过要求责任方投资能源效率或购买证书，可以更直接地实现相同的结果

Additional Slides

额外的补充

Comparison of Schemes (1)

Features	Permit Schemes	EE Certificate Schemes
Implementation	Cap on energy used or supplied	Energy efficiency target
Obligation	Stay within the set cap on energy used or supplied	Achieve the set target level of energy efficiency
Obligated parties	Energy users or energy suppliers	Energy users or energy suppliers
Instrument	Permits for each unit of energy used or supplied	Certificates representing verified energy savings
Allocation to obligated parties	Government sells permits or distributes them free of charge	Obligated parties purchase certificates or create their own

方案对比 (1)

特点	许可方案	能效证书方案
实施	使用或供应能源的限制	能源效率目标
责任	维持在规定的能源使用或供应限制之内	达到规定的能源效率目标水平
责任方	能源使用者或能源供应商	能源使用者或能源供应商
工具	对使用或供应的每一单位能源的许可	代表已核实能源节省量的证书
向义务方的分配	政府出售或免费发放许可	责任方购买证书或创建自己的证书

Comparison of Schemes (2)

Features	Permit Schemes	EE Certificate Schemes
Trading of instruments	Not necessary but can be used to encourage implementation of lowest cost energy savings	Not necessary but can be used to enable third parties to carry out energy efficiency projects
Funding for energy efficiency	Only if revenue from permit allocation is “recycled” to fund energy efficiency projects	Revenue from sales of certificates directly funds energy efficiency projects
Measurement and verification	Not required (energy savings included in cap)	Required (energy savings from individual projects)

方案对比（2）

特点	许可方案	能效证书方案
工具的交易	没有必要，但也可进行交易，以鼓励执行最低成本能源节省	没有必要，但也可进行交易，以使第三方执行能源效率项目
能效资金	仅有在许可分配产生的收益“回收”之后，才能用于为能源效率项目提供资金	出售证书的收入直接用于为能源效率项目提供资金
测量与验证	无要求（能源节省量包含在限制内）	要求（单个项目的能源节省量）