Low Carbon Development of Nur-Sultan city
努尔苏丹市低碳发展

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Priority Investment Low Carbon projects
优先投资低碳项目

Pre-technical feasibility using Clean Technology Fund
利用清洁技术基金进行技术前可行性研究

1. Saving fuel & Clean Air Project
节约燃料和清洁空气项目

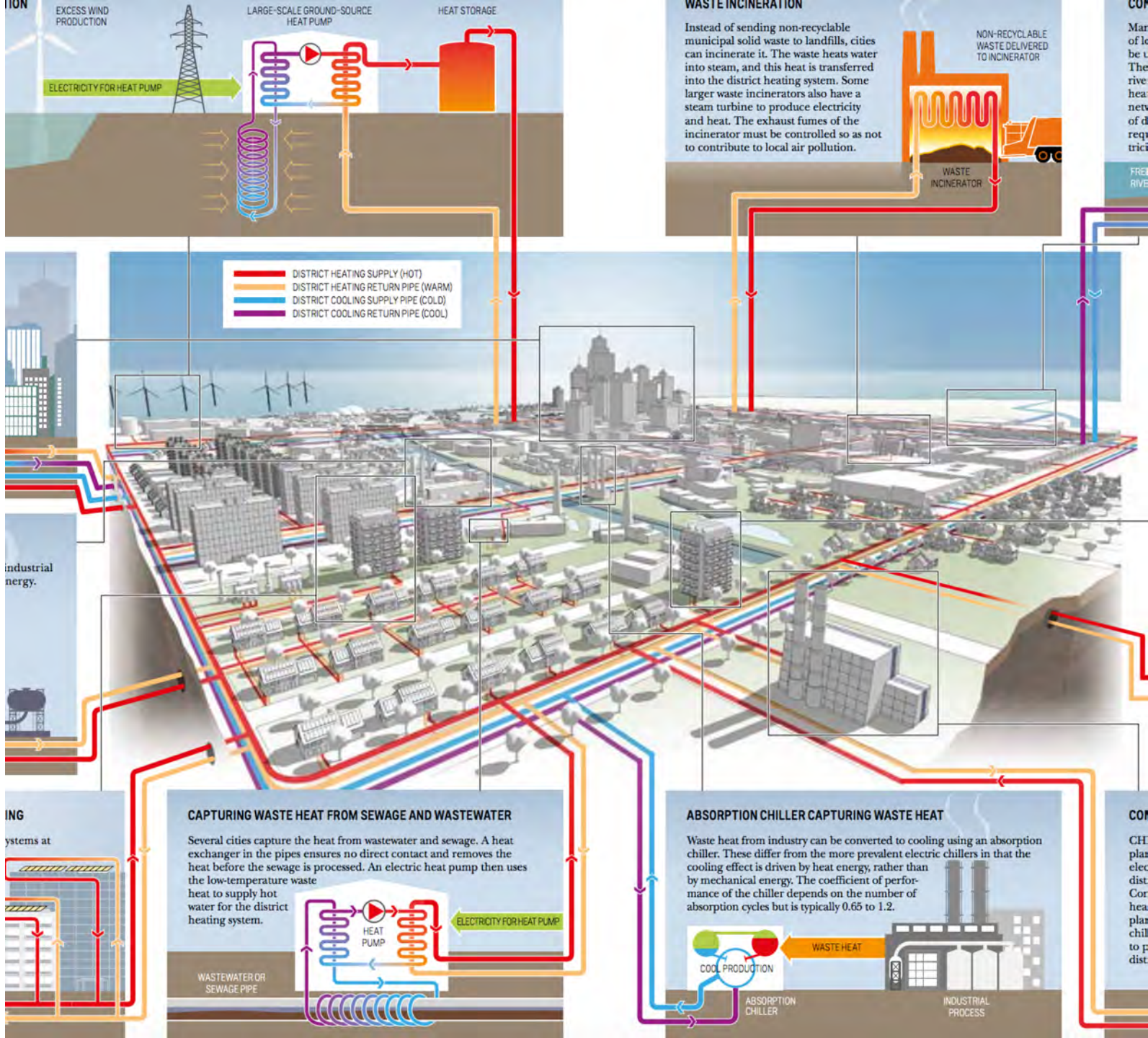
- Current situation: Vehicle engines are running in cold winter to prevent frozen batteries being frozen.
  现状: 在寒冷的冬天，汽车引擎保持运转，以防止电池结冻
- Block heater technology: Simple plug-in connection will save fuel and reduce emissions from engine running
- 缸体加热器技术:简单的插入式连接将在引擎运转时，节省燃料和减少排放
- https://www.youtube.com/watch?v=OccDOM_3qd8&app=desktop#searching

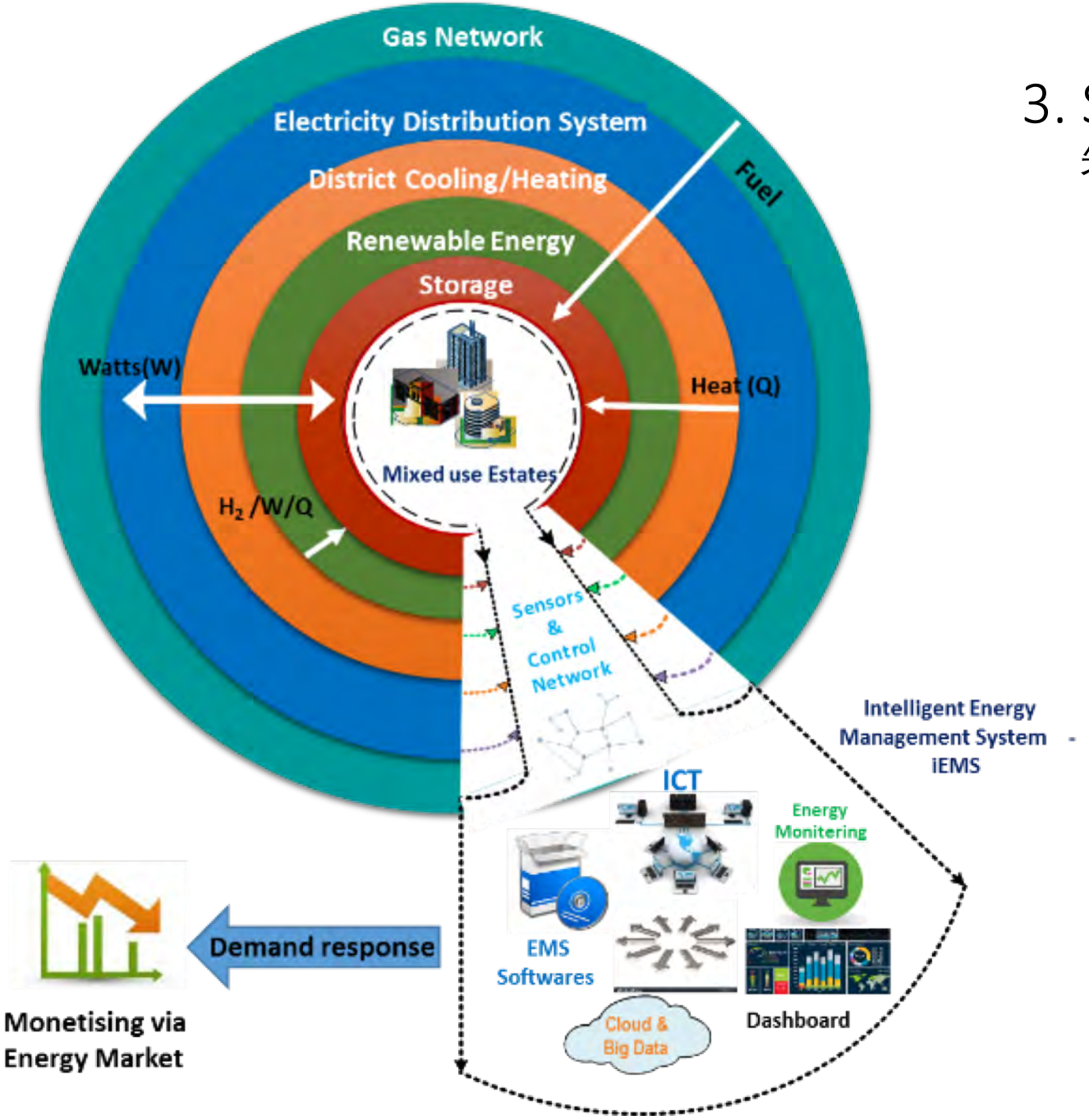
Block heaters vs Remote starter
缸体加热器vs远程启动器

- Block heaters are simple electric heating elements that can warm up car engine through a number of different methods. Basically a block heater prevents the coolant from freezing, and it can also stop the oil from turning into tar in extremely cold temperature.
- 缸体加热器是一种简单的电加热元件，可以通过多种不同的方法对汽车发动机进行加热。基本上，加热器可以防止冷却剂结冰，也可以防止汽油在极低的温度下变成焦油。
- Remote starters simply get a car running ahead of time, which warms up a car engine and also interior for comfort. Remote starters will lead to engine wear and generate emissions when a car is no in-use.
- 远程启动器可以让汽车提前运行，这不仅可以让汽车引擎升温，还可以让车内更舒适。当汽车不使用时，远程启动器会导致引擎磨损并产生排放。

2. Upgrading district heating (DH) at sub-urban districts 改善郊区的区域供热系统

- Sub-urban districts in Astana reply on heavily polluting old heating-only boilers.阿斯塔纳郊区依赖严重污染的旧供暖锅炉。
- Modernizing district heating systems in sub-urban districts in Astana will support better livelihood in those poor districts.对阿斯塔纳郊区供热系统进行现代化改造，将有助于改善贫困地区的生活。
- Range of energy efficient low-carbon features will be assessed to confirm feasibility and suitability将评估一系列节能低碳特征，以确定其可行性和适用性





3. Smart energy management system 智能能源管理系统

- Computer-aided tool for monitoring, control and optimization of energy system for continuous improvement 计算机辅助工具，用于监测、控制和优化能源系统，以便持续改进
- Smart management of EMS at various levels从各层面对能源系统进行智能管理
- Possibility to use multi-energy management进行多种能源管理

4. Deposit-Refund System
押金退还系统

- Waste collection is the most difficult and expensive part of waste management system. 垃圾收集是垃圾管理系统中最困难和最昂贵的部分。

- Container deposit legislation mandates that a refund is given when reusable packaging is returned. 容器押金法规定，当可重复使用的包装被退回时，退还押金。

- Deposit-refund system enables collection of recyclable waste easy, encourages public awareness and behaviors changes on waste issue. 押金退还系统可方便回收再造垃圾，鼓励市民改变对垃圾的认识和行为。

- Installing deposit-refund machines at supermarkets shows great success, rather than creating a separate waste collection center. 在超市安装押金退还机是巨大的成功，而不是创造了另一个垃圾收集中心。

Containerised model

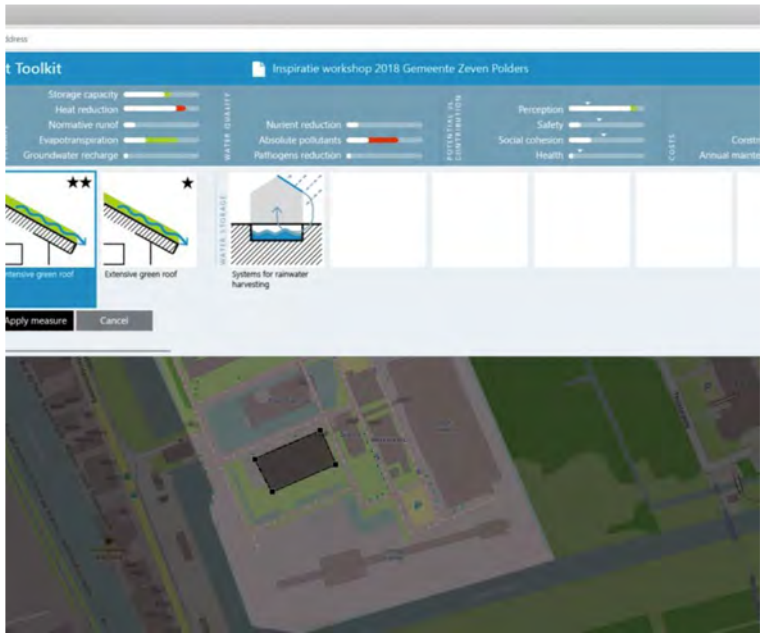
5. Waste-to-Energy 垃圾变能源

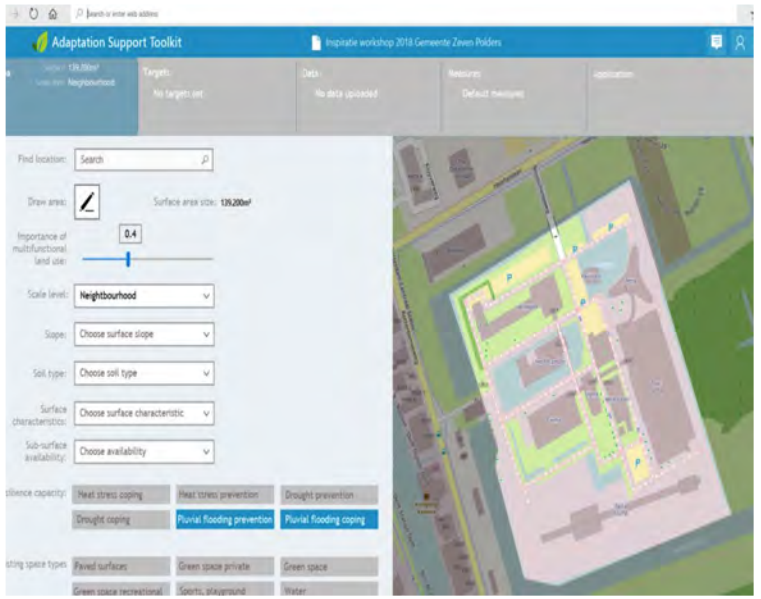
- Solutions for solid community waste
  社区垃圾的解决方案
- **Thermal gasification** has low emissions, modular application and low capital and operational costs. 热气化具有低排放、模块化应用、低资本和低运营成本的特点。
- Thermal gasification can generate hot synthetic gas, that produce power and heat. 热气化可以产生热合成气体，产生动力和热量。
- **Plastic modification,** using pyrolysis can produce diesel fuel from plastic 塑料改性，利用热解技术可从塑料中生产柴油燃料
- Dieisel compliant EN590
- 15–55 % less Nox
- Less than 1 ppm SOx

6. Adaptation Solutions Tool to support Ecosystem-based adaptation (EbA) measures for flood control in Astana

适应解决方案工具，用以支持阿斯塔纳基于生态系统的适应措施，以加强洪水控制

- Climate induced risks like flood became more frequent and intensified. Using scientific data and social-economic analysis, high risk and vulnerable areas and suitable Ecosystem-based adaptation (EbA) measures can be assessed and determined using ICT-based mapping tool.气候引发的洪水等风险变得更加频繁和加剧。利用科学数据和社会经济分析，利用基于信息技术的制图工具，可以评估和确定高风险和脆弱地区以及基于生态系统的适应措施。
- https://youtu.be/XaFJGTfiing





Ecosystem-based adaptation (EbA) measures
基于生态系统的适应措施

- Ecosystem-based adaptation (EbA) measures using urban water (blue) infrastructure with green assets and ecosystem services are effective measures for flood control, drought mitigation, heat stress reduction, and carbon sink基于生态系统的适应(EbA)措施利用城市水(蓝色)基础设施与绿色资产和生态系统服务，是防洪、缓解干旱、减少热应力和碳汇的有效措施
- Adding grass/trees in street, green roofing, green facades, filtration trench, porous pavement, rainwater retention pond, urban garden/agriculture, water roof, and infiltration field are some examples that provide a carbon sink, cooling effect, and water conservation among others.在街道上增加草坪/树木、绿色屋顶、绿色外墙、过滤沟、多孔路面、雨水蓄水池、城市花园/农业、水屋顶和渗透场等都是提供碳汇、降温效果和节水等功能的例子。
- These will also provide co-benefits like aesthetic quality, recreational and restorative capacity, improved local air quality, and health benefits.这些还将产生协同效应，如美观、休闲放松和恢复能力、改善当地空气质量、和健康效益。