

Innovative Heating and Green Building Technologies in Ulaanbaatar

乌兰巴托的创新供暖技术和绿色建筑技术

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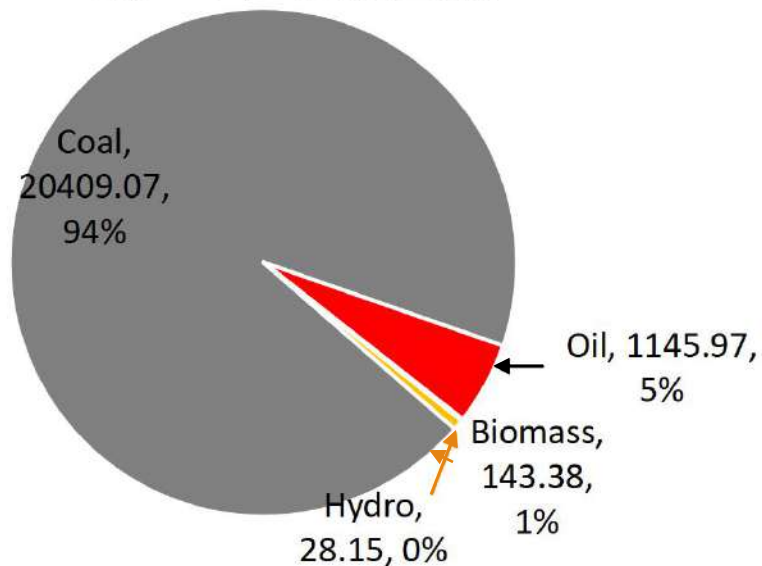
Project summary 项目概要

- ✓ Review potential innovative heating and green building technologies that might be appropriate for Ulaanbaatar households, in particular, in Ger Districts;
- ✓ 审核可能适合乌兰巴托家庭的潜在创新供暖技术和绿色建筑技术，特别是在蒙古包区；
- ✓ Explore the barriers and opportunities to deploying those technologies;
- ✓ 探索运用这些技术将会面临的阻碍和机会；
- ✓ Highlight specific technologies for a pilot program to deploy such technologies in Ulaanbaatar
- ✓ 重点关注试点项目具体技术在乌兰巴托的应用

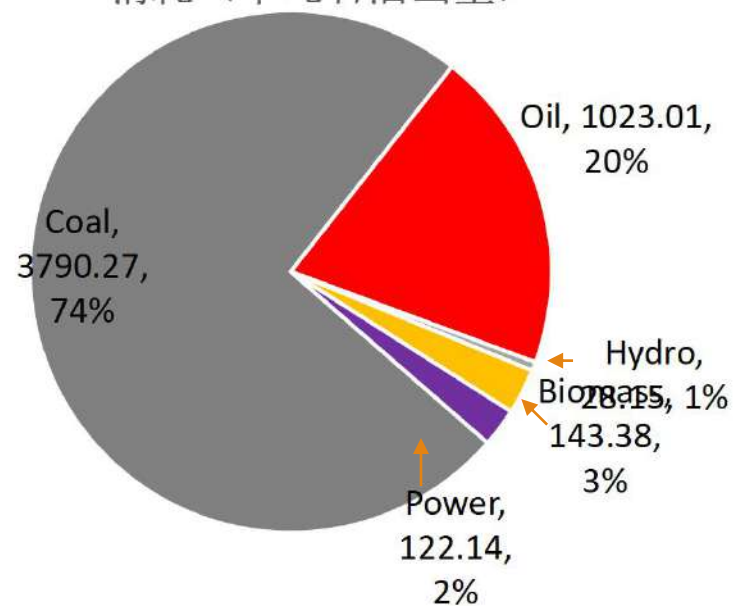
Mongolia Energy Balance

蒙古能源平衡

PRODUCTION (ktoe)
生产 (千吨石油当量)



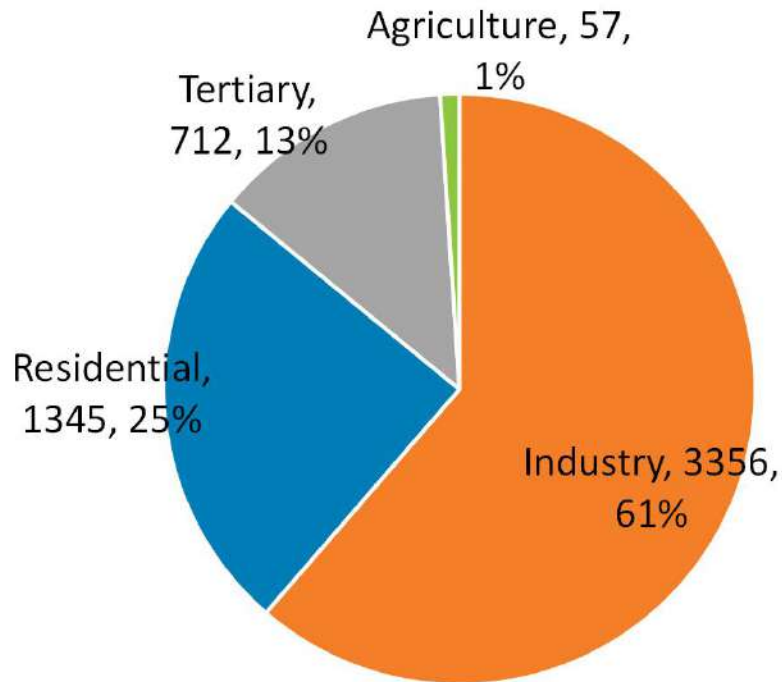
CONSUMPTION (ktoe)
消耗 (千吨石油当量)



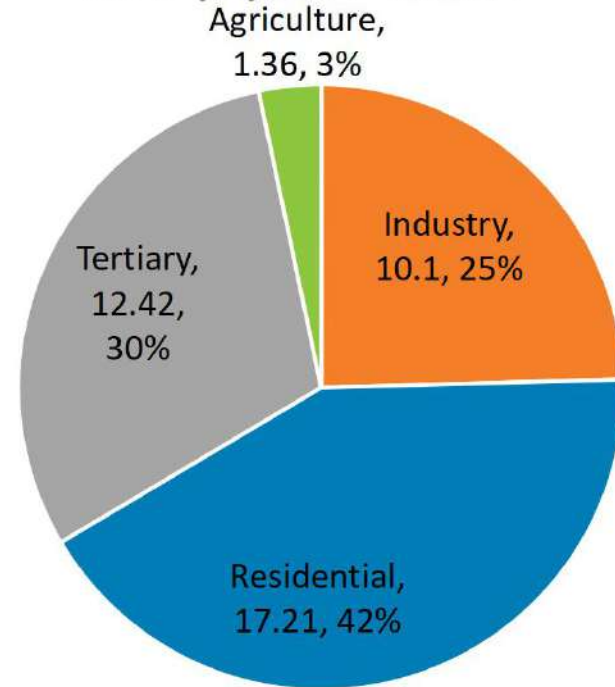
Source: Enerdata. Mongolia Energy Balance 2016 (accessed 13 September 2018).
来源：法国能源信息统计所. 2016年蒙古电力和热量平衡 (2018年9月13日获取)

Mongolia Electricity and Heat Consumption 蒙古的电力和热消耗

ELECTRICITY (GWh) 电力 (吉瓦时)



HEAT (PJ) 热量 (皮焦)



Source: Enerdata. Mongolia Electricity and Heat Balances 2016 (accessed 13 September 2018).

来源：法国能源信息统计所. 2016年蒙古电力和热量平衡 (2018年9月13日获取)

Technologies Reviewed and Recommended for Pilot 技术已通过审核并推荐试点

Innovative heating technology 创新供暖技术

- ✓ Ground-source heat pumps
- ✓ 地源热泵
- ✓ Air-to-air heat pumps
- ✓ 空气源热泵
- ✓ Solar water heaters
- ✓ 太阳能热水器
- ✓ Bioenergy stoves
- ✓ 生物能源炉

Green building technology 绿色建筑技术

- ✓ Insulation
- ✓ 隔热
- ✓ Doors/Windows
- ✓ 门 / 窗

Recommended Technology for Pilot
建议试点应用的技术

Key Considerations for Pilot Recommendation

试点建议的主要考虑因素

- ✓ Consistency with Government policies
- ✓ 与政府政策保持一致
- ✓ Proven and mature technology
- ✓ 成熟的技术
- ✓ Level of energy efficiency
- ✓ 能效水平
- ✓ Applicability to Ulaanbaatar, in particular in Ger districts
- ✓ 在乌兰巴托特别是蒙古包区的适用性
- ✓ Market potential
- ✓ 市场潜力
- ✓ Replicability
- ✓ 可复制性
- ✓ Integrated solution – integrating urban planning with energy plan is a must
- ✓ 综合解决方案——必须将城市规划与能源计划相结合

Barriers Identified

已知阻碍

Area领域	Barriers阻碍
Technical and Infrastructure 技术和基础设施	<ul style="list-style-type: none"> - Inadequate electricity T&D capacity 输配电能力不足 - Limited technical capacity 技术能力有限 - Lack of qualified experts in both private and public sector 私营和公共部门缺乏合格的专家
Economic and Financial 经济和金融	<ul style="list-style-type: none"> - High upfront cost 预付成本高 - Lack of fully competitive market 缺乏完全竞争的市场 - Limited number of domestic producers, technology importers, and traders 国内生产商、技术进口方和贸易方数量有限 - Lack of concessionary long-term financing mechanism 缺乏长期优惠的融资机制
Legal, Policy, Institutional 法律、政策和机构	<ul style="list-style-type: none"> - Inadequate policy and regulatory framework 政策和监管框架不充分 - Lack of efficiency, performance, and reliability standards 缺乏效率、效能和可靠性标准 - Low institutional capacity and frequent institutional changes 机构能力低，体制变化频繁
Information 信息	<ul style="list-style-type: none"> - Asymmetrical and insufficient information on technological options and their cost-benefits 关于技术方案及其成本效益的信息不对称和不充分
Cultural and Behavioral 文化和行为	<ul style="list-style-type: none"> - Lack of consumer acceptance of or reluctance in using new technology 消费者不愿意使用新技术

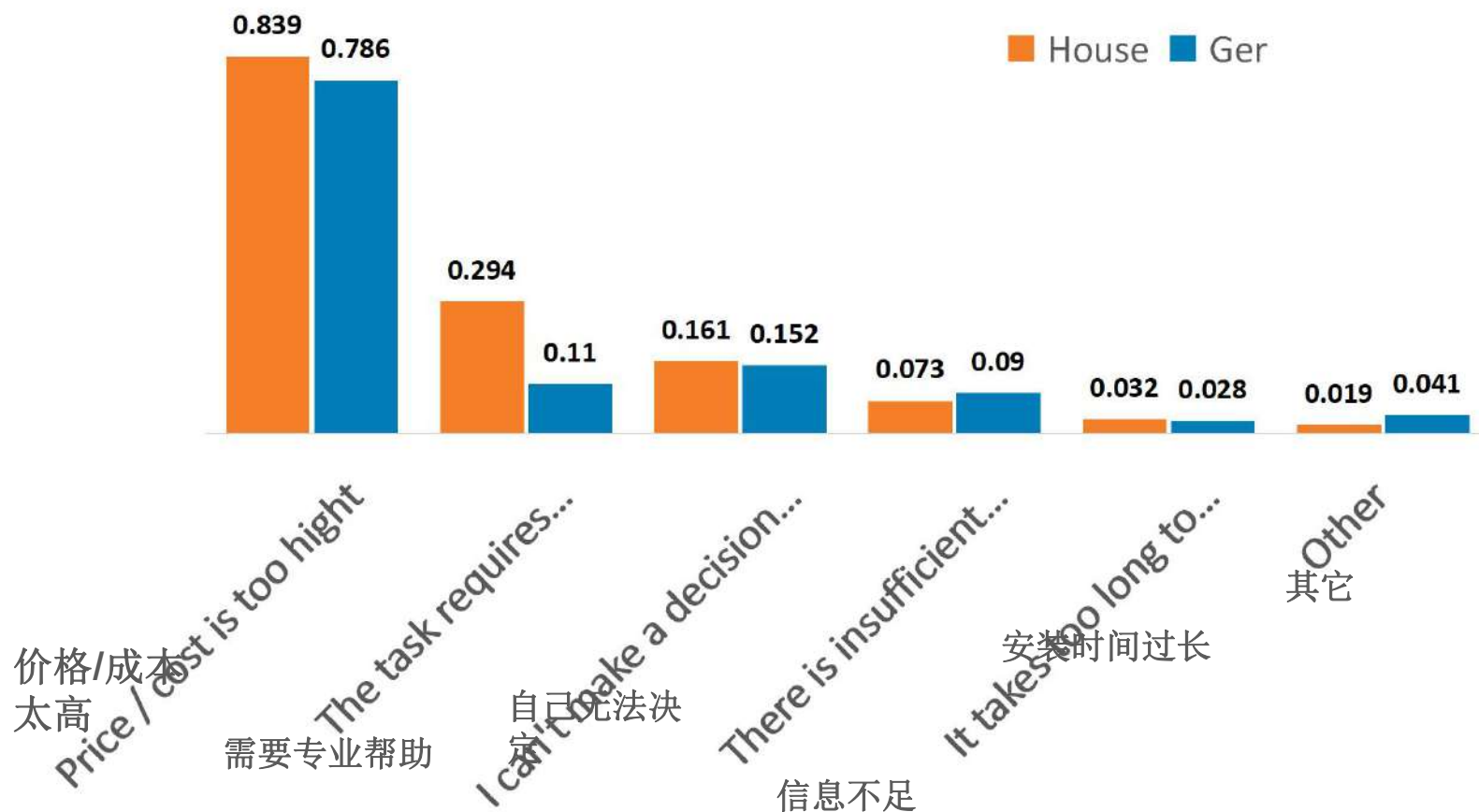
Suggested Key Actions to Make a Bankable Project

制定银行愿意担保的项目需要采取的关键行动

- ✓ Expand power generation and supply infrastructure including house wiring
- ✓ 扩大发电和供电基础设施，包括室内布线
- ✓ Develop and implement training program to create skilled workforce for clean heating technologies
- ✓ 制定并实施培训计划，培养技术纯熟的清洁供暖技术人才
- ✓ Devise financing model to lower high upfront cost through grants/concessionary loans/tax exemption
- ✓ 通过赠款/优惠贷款/免税来设计融资模式以降低高额的预付成本
- ✓ Establish and enforce national standards for the performance, efficiency, and reliability of the clean heating technologies
- ✓ 制定并实施清洁供暖技术效能、效率和可靠性国家标准
- ✓ Conduct awareness program for end users
- ✓ 大力宣传、提高终端使用者的意识

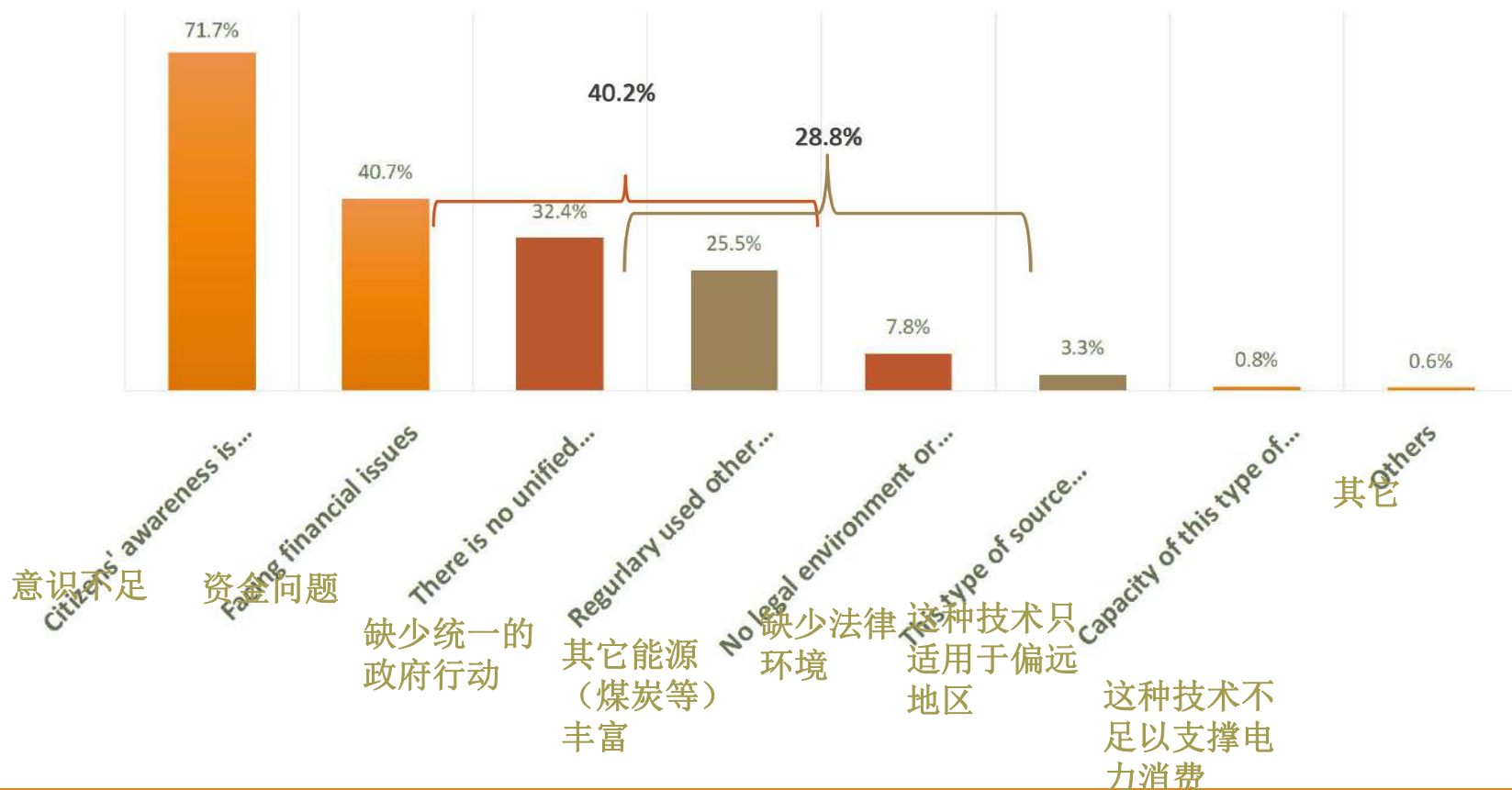
Ger Area Household Survey Results 蒙古包区住户调查结果

Why not Invest in Heating or Green Building Technologies? 为什么不投资供暖技术或绿色建筑技术?



Ger Area Household Survey Results 蒙古包区住户调查结果

What not using advanced technologies? 为什么不使用先进技术?

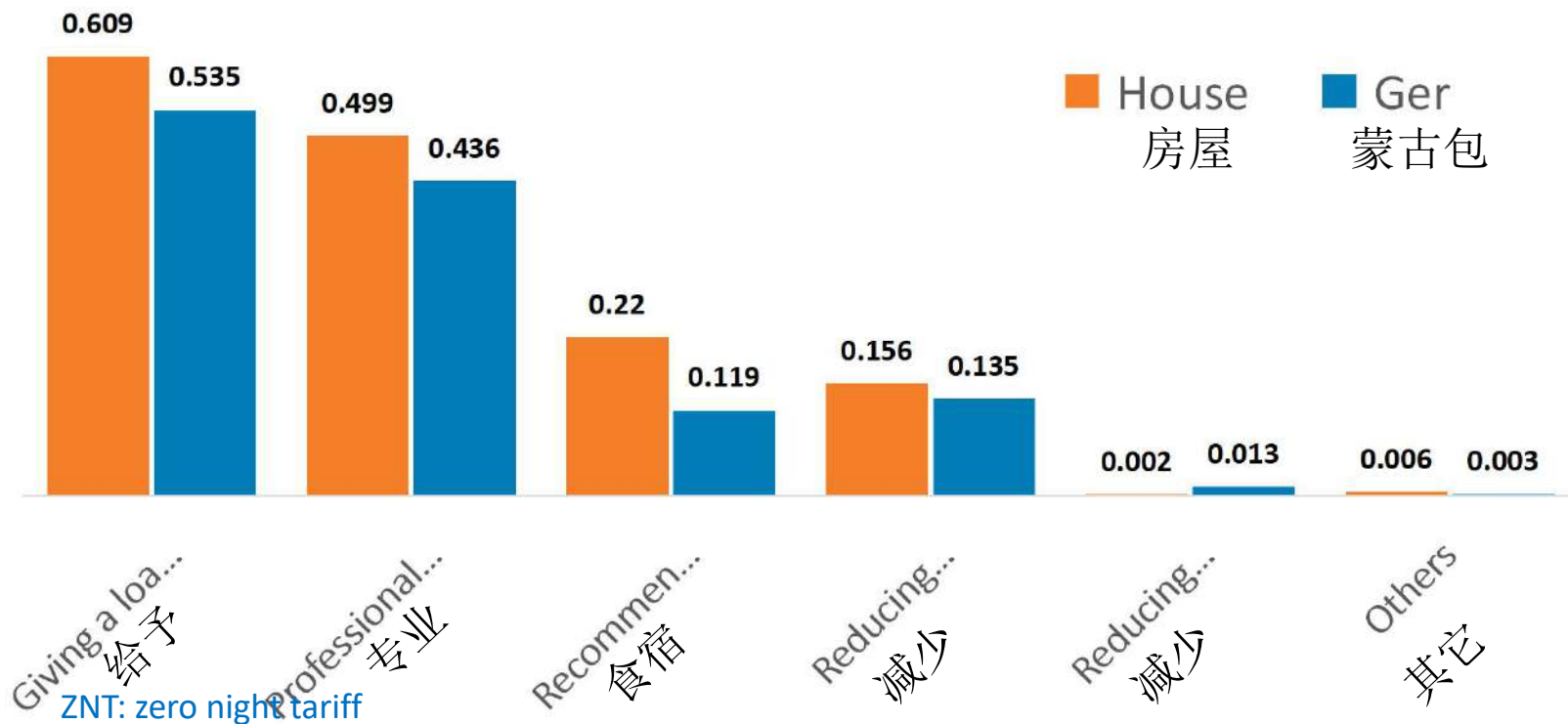


Ger Area Household Survey Results

蒙古包区住户调查结果

What supports are needed?

需要什么支持？



Thank you!!

谢谢