# MON: Upscaling Renewable Energy Sector Project
# 蒙古案例：扩大可再生能源的项目

## JFJCM Support: Solar PV and Battery Storage
## JFJCM的支持：太阳能光伏和电池存储

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**亚太低碳技术高峰论坛**

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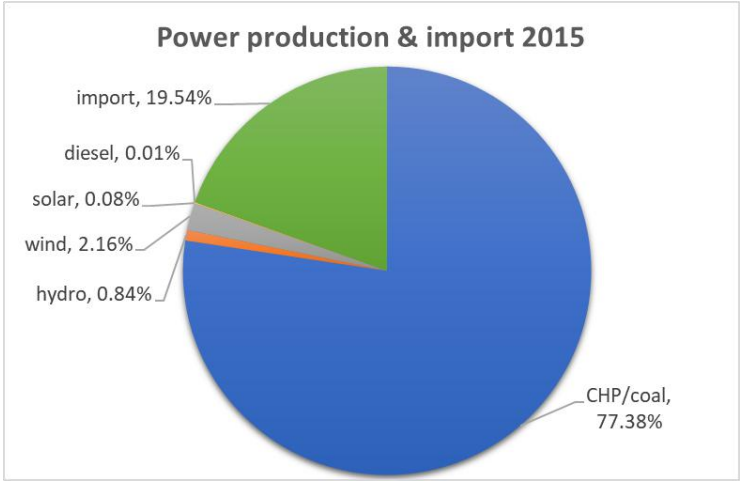
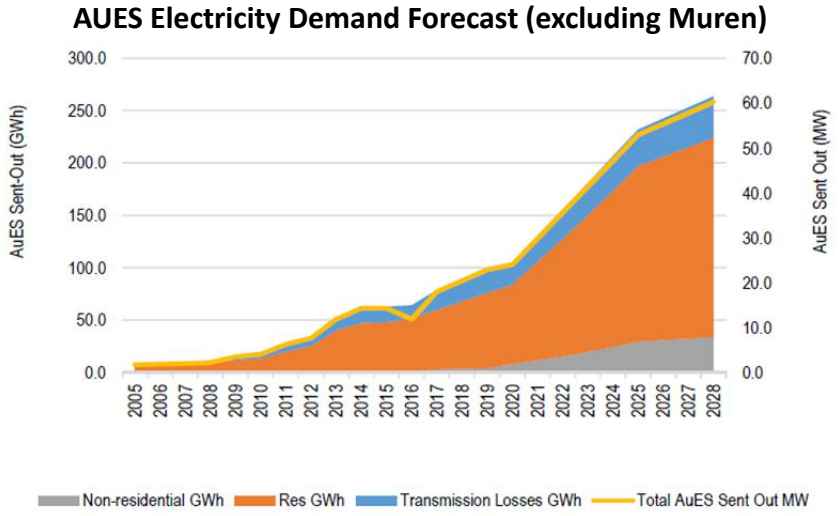
# Background背景

- High dependence on carbon intensive power source, despite good RE potential
- Remote areas depend heavily on imported high carbon electricity from neighboring countries which meets 70% of load demands
- long stretched transmission lines results in very high transmission and distribution losses – over 23% for AUES
- Rapidly growing electricity demand
- 尽管具有良好的可再生能源潜力，但对碳密集型电源依赖性很高
- 偏远地区严重依赖来自邻国的高碳电力，满足70％的负荷需求
- 长距离传输线导致非常高的输配电损耗 - AUES超过23％
- 电力需求快速增长




Source: Ministry of Energy presentation



# Basic data基本数据

| | |
|---|---|
| Sector<br>部门 | Energy - Renewable energy generation – solar and Wind<br>能源 - 可再生能源发电- 太阳能和风能 |
| Description<br>描述 | The proposed project will support to (i) deploy the distributed renewable energy systems in remote and less developed regions in Mongolia, and (ii) enhance capacity of local public utilities in investment planning, project management, and grid control for sustainable renewable energy upscaling in the targeted region. Upon successful completion, the project delivers clean electricity to 70,000 households while annually avoiding 82,789 tons of carbon dioxide emission.<br>拟议项目将支持（i）在蒙古偏远和欠发达地区部署分布式可再生能源系统，以及（ii）提高当地公用事业在投资规划、项目管理和电网控制方面的能力，以扩大可持续可再生能源在目标区域的利用。成功结项后，该项目为70,000户家庭提供清洁电力，同时每年减少82,789吨二氧化碳排放。 |
| Carbon Finance from JFJCM<br>来自JFJCM的碳金融 | $6 million<br>600万美元 |
| Other Sources of Funding<br>其他资金来源 | Strategic Climate Fund: $14.6 million<br>ADB: $40 million<br>GOM: $5.7 million<br>战略气候基金：1460万美元<br>亚行：4000万美元<br>GOM：570万美元 |
| Impact<br>影响 | Greenhouse gas emissions reduced and imported electricity reduced<br>减少温室气体排放，减少电力进口 |

# Mongolia: Upscaling Renewable Energy Sector Project
# 蒙古案例：扩大可再生能源的项目

# Japan Fund for Joint Crediting Mechanism
# 日本联合信贷机制基金（JFJCM）

Install 41 MW of new renewable energy systems such as solar PV, wind power with advanced battery storage technology and energy management systems, and heat pumps in the Western and Altai-Uliastai regions.

在西部地区和Altai-Uliastai地区安装41兆瓦的新型可再生能源系统，如太阳能光伏，具备先进电池存储技术和能源管理系统的风力发电以及热泵。

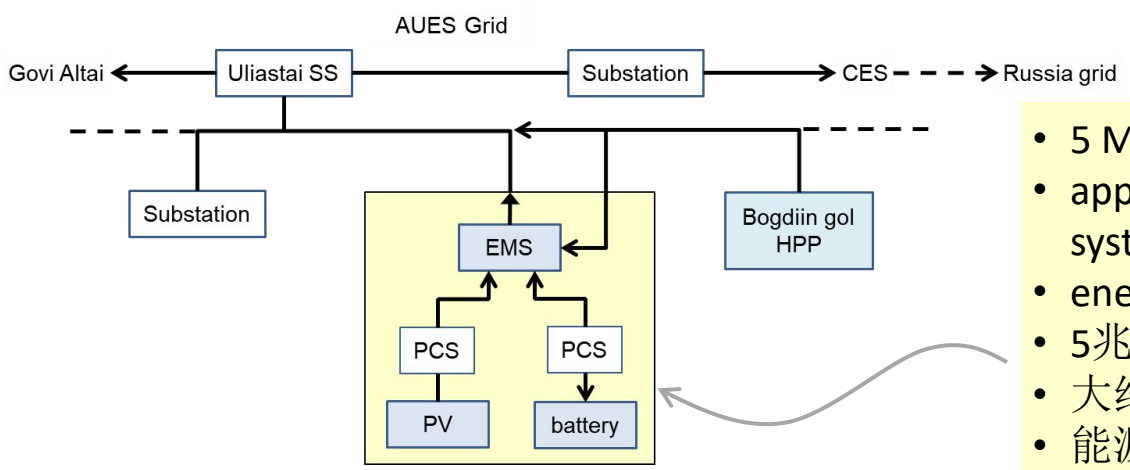
JFJCM support

| Location地点 | Province省 | Component组件 |
|---|---|---|
| Umnogovi | Uvs | 10MW wind风能 |
| Altai | Govi-Altai | 10MW solar PV太阳能光伏 |
| Altai Soum (independent grid) | Govi-Altai | 0.5MW wind风能 + battery电池 |
| **Uliastai** | **Zhavhan** | **5MW solar PV + battery** |
| Telmen | Zhavhan | 5MW wind风能 |
| Muren | Khovsgol | 10MW solar PV太阳能光伏 |
| Hovd and Aimag Centers | Hovd/Uvs/Govi-Altai | 0.5MW heat pumps热泵 |

JFJCM supports the adaptation of advanced low-carbon technologies: advanced battery technology resilient up to -40deg Celsius with a minimum of 4,400 charge-discharge cycles

JFJCM支持采用先进的低碳技术：先进的电池技术，可在-40摄氏度的温度下恢复，最少可达4,400次充放电循环

# Uliastai subproject/子项目




- 5 MW solar PV system
- approx 3.6 MWh advanced battery system
- energy management system (EMS)
- 5兆瓦太阳能光伏系统
- 大约3.6兆瓦时的先进电池系统
- 能源管理系统（EMS）

- Mode of operation运行模式:
  - ✓ Charge surplus power from hydropower plant outside of the sunlight hours and release during day time
  - ✓ Charge surplus power from PV in mid day and discharge during the evening peak
  - ✓ 在日照时间外由水电站充电，并在白天放电
  - ✓ 在中午由光伏电板充电，在晚上高峰期放电
- The very first utility scale battery system in the country combined with grid connected renewable energy
- 该国第一个公用事业规模的电池系统与并网可再生能源相结合

# Advantages优势

- Make maximum use of all the locally produced renewable energy
- Reduce carbon intensive domestic and imported grid electricity, while strengthening Mongolia's power self-sufficiency
- Reduce transmission losses
- Create flat supply of reliable energy during the day to encourage commercial businesses in the Uliastai town
- 充分利用当地生产的所有可再生能源
- 减少碳密集的国内和进口电网电力，同时加强蒙古的电力自给自足
- 减少传输损耗
- 在白天创造可靠的能源供应，保障Uliastai镇的商业企业的电力需求

## Emission reduction achieved by displacement of grid electricity by: 通过电网更替实现减排：

1. power generated by solar PV and exported directly to the grid太阳能光伏发电并直接输出到电网
2. power stored in the battery storage system, originally generated by the Pv最初由光伏电板发的电存储在电池存储系统中
3. power stored in the battery storage system, originally generated by the existing hydropower plant最初由现有的水力发电厂发的电存储在电池存储系统中

# Co-benefits协调效应

1. Reduction in emissions of NOx, sulfur oxides (SOx), and particulate matter (PM), especially from coal plants减少氮氧化物（Nox），硫氧化物（SOx）和颗粒物（PM）的排放，特别是来自燃煤电厂的排放
2. Exposure of new technology to power system engineers, and increase of institutional knowledge and experience of renewable energy and energy storage management向电力系统工程师展示新技术，增加可再生能源和储能管理的机构知识和经验
3. Creation of new job opportunities and R&D in other smart grid technologies创造新的就业机会和其他智能电网技术的研发

# Thank You

# 谢谢