Market Potential and Case Study of Biomass Heating in China

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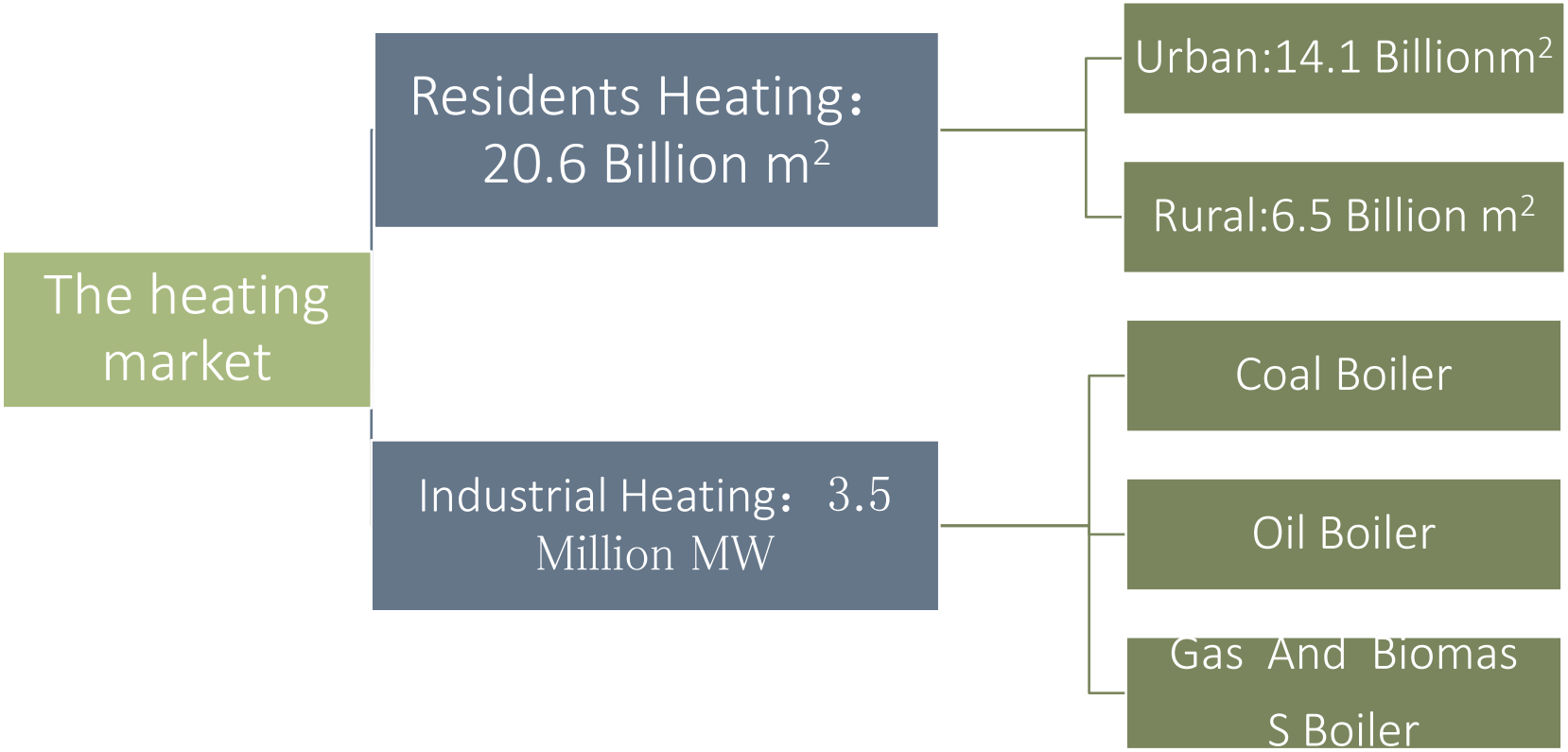
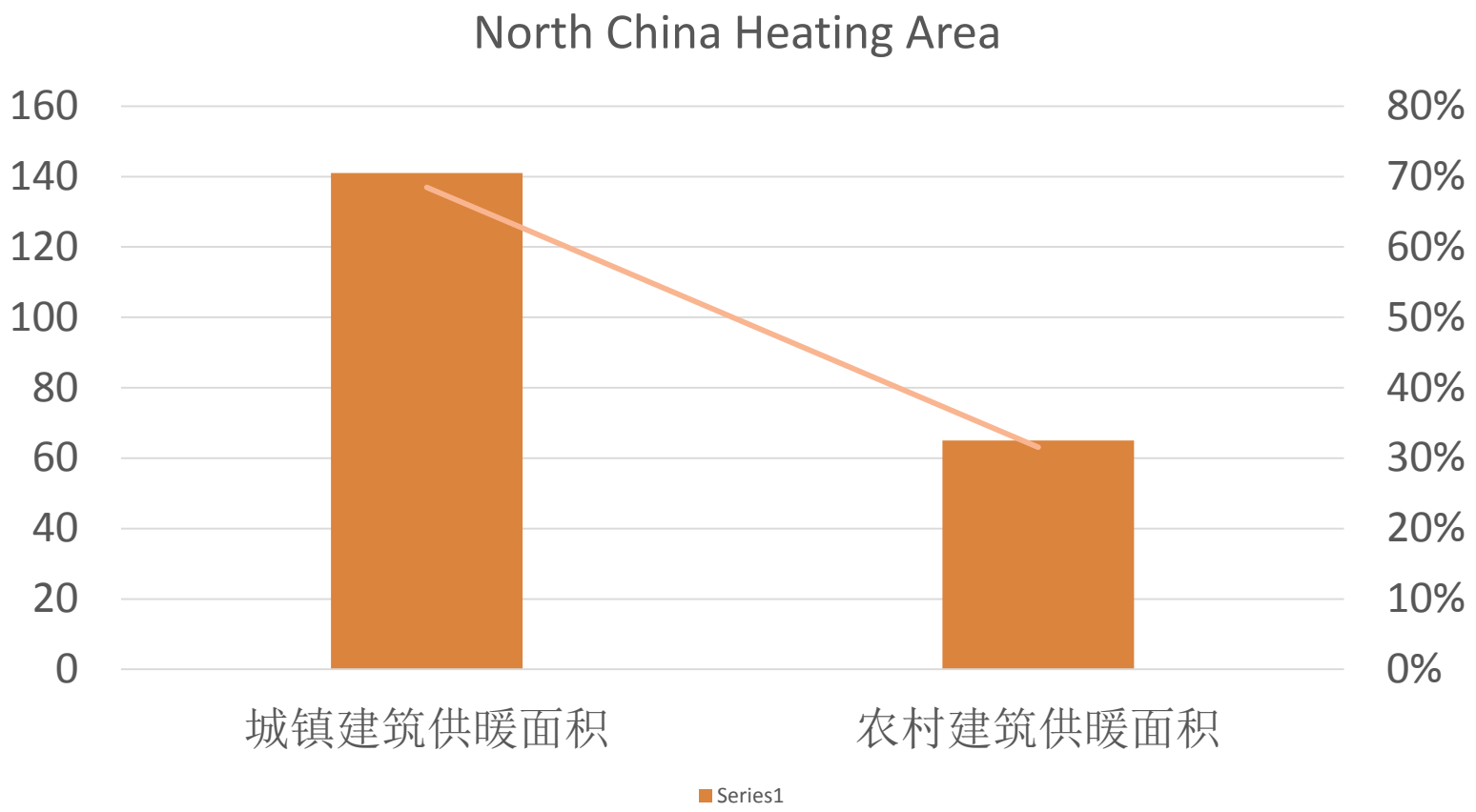
I. Heating Status

1、Heating Market Overview

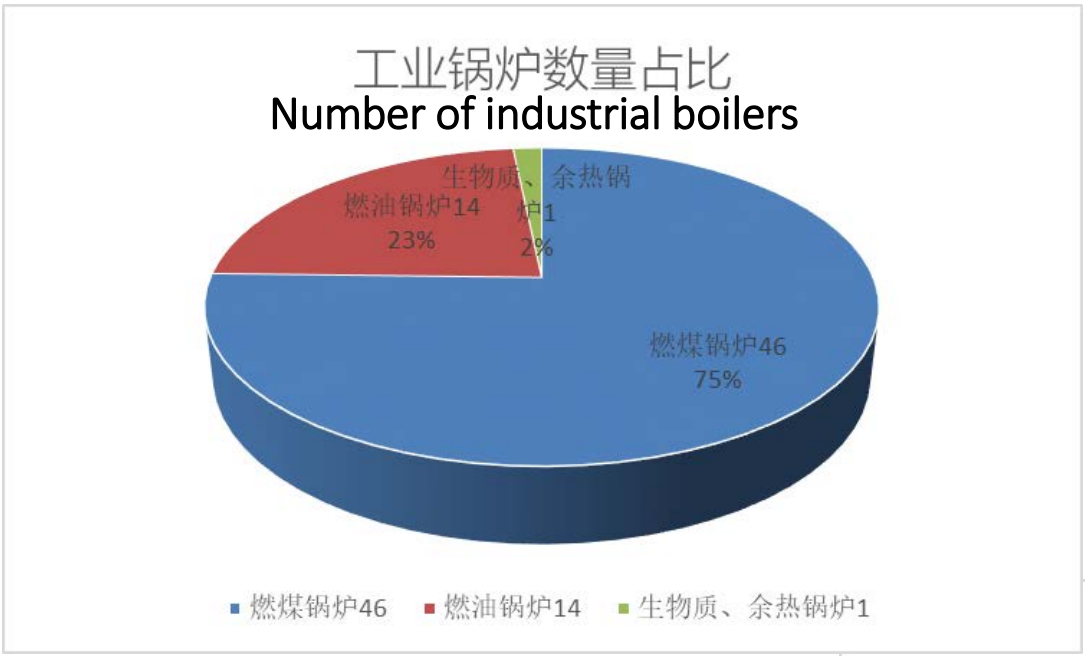


2、Residents Heating



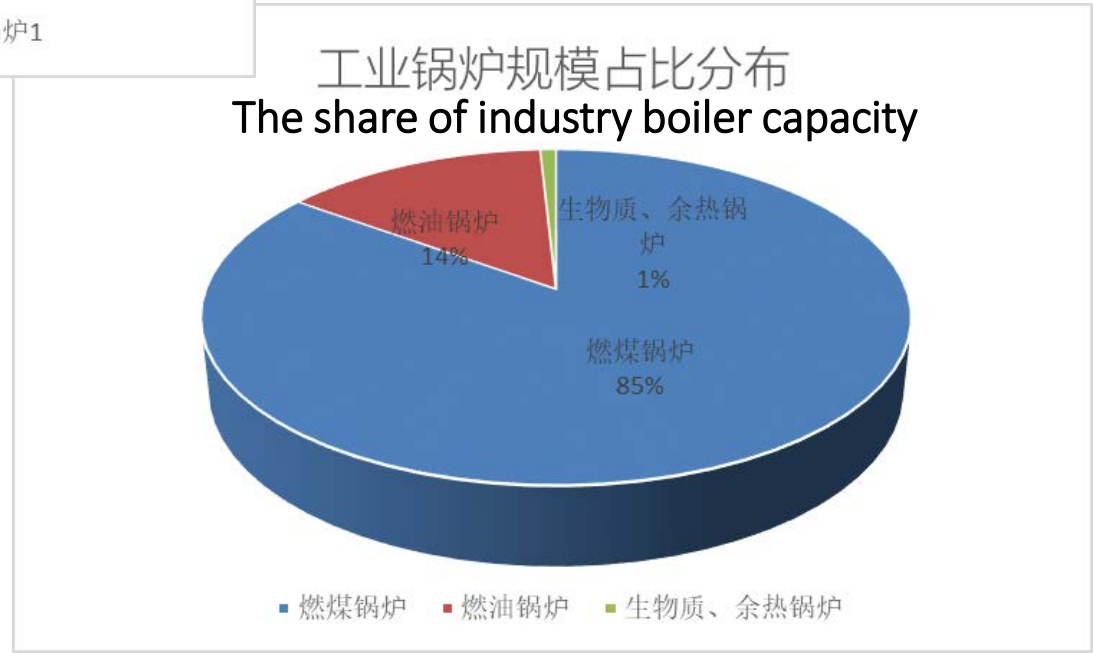
- The area heated by coal :83%， gas、Electricity 、geothermal;、bioamass、 solar、waste heat:17%.
- Coal consumption:4 00 Million TCE/Y， Half of the coal is used in the countryside.
- Biomass for heating :200 Million m^2.

3、Industrial Heating

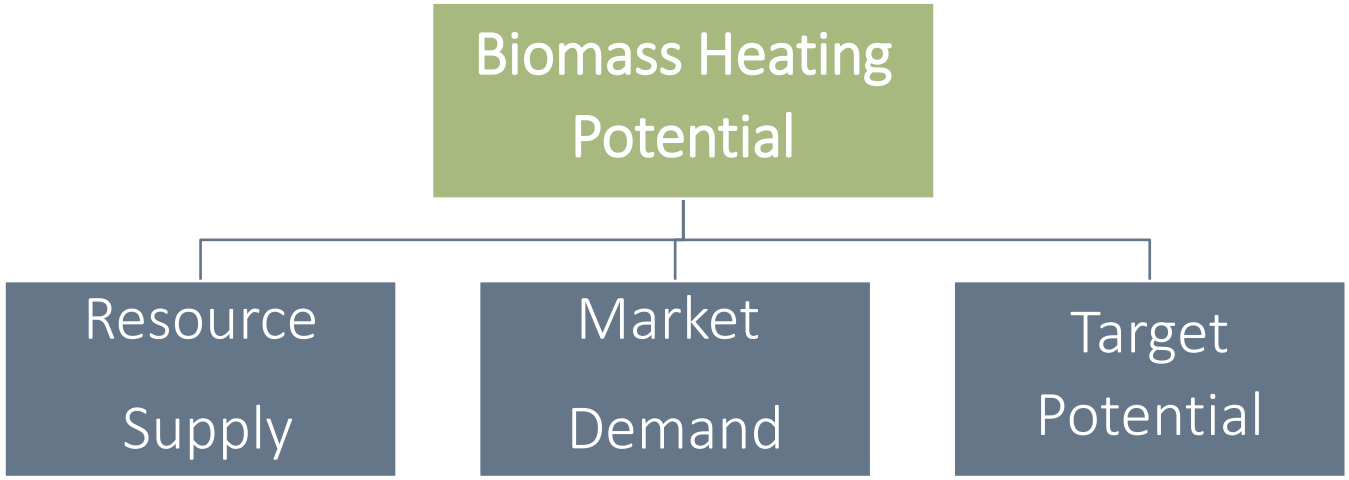


- Total capacity:3.5 Million MW
- Average capacity: 3.8 ton vapor/h, under 2 ton vapor/h accounted 66.5%

Alternative potential of industrial boiler



II. Biomass Heating Potential



单位：Million TCE

Category and time	2020	2030
Available	**264**	**288**
Residue of agriculture and forestry	**228**	**228**
Straw	175	175
Residue of agrotechny	35	35
Forestry waste	18	18
MSW	**36**	**60**
Biomass heating potential	130	140

III. Comparison of Heating Economy

Comparison of the economic efficiency of various heating technologies

Type of fuel	Net calorific value	Price of fuel	Efficiency of boiler	Heating cost
Nature gas	36000（kJ·m-³）	3.5 RMB/m³	92%	148（yuan/ GJ）
Oil	41868（kJ·kg-1）	4600 RMB/ton	88%	175（yuan GJ）
Coal	20900（kJ·kg-1）	580 RMB/ton	65%	59（yuan / GJ）
Electricity	3600（kJ·kWh-1）	0.7 RMB/kWh	97%	281（yuan/ GJ）
Pellets	17500（kJ·kg-1）	900 RMB/ton	85%	66.4（yuan/ GJ）
Biomass CHP	13230（kJ·kg-1）	340 RMB/ton	47%	51.4（yuan/ GJ）
Biomass gasify	5040（kJ·kg-1）	300 RMB/ton	85%	58（yuan/ GJ）

IV. Case Study

1、Residents Heating–Biomass CHP

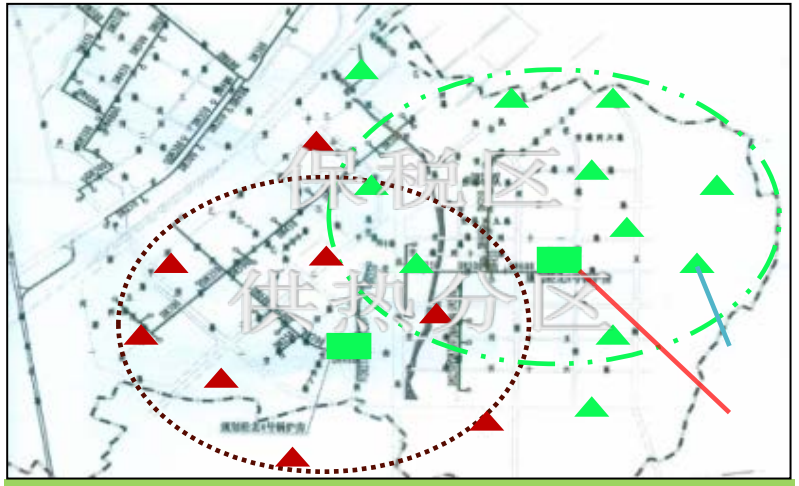
- The project covered a total heating network area of **2.55 million** square meters
- **Supplied heating area : 1.85 million** square meters in winter.
- The project has generated a total of **730 GWh** power, fed a total 620 GWh power into the power grid, and supplied a total **of 2.7 million GJ** heat since its operation. Annual power generation of 188 GWh.

Total investment : 420 million RMB

The average system thermal efficiency increases from 24% to 45%, but the rate of return is -9.8%

2、Industrial District Heating

Demonstration Project in Changchun



District Heating in Winter.

Heating area: 6,000,000㎡

Boiler size: 3×56MW + 2×42MW

Boiler plant area: 50799㎡

Pellets demand: 120000~150000t

District Heating Project in Jilin

Pellet from straw（30,000 t）-Heat supply operation and ash utilization（3,000 t）

District Heating

Heating area: 1,000,000m²

The total investment: 8500万元（85 million）

Boiler Capacity： 3×29MW+1×14MW

V. Summary

Seize the opportunity

Big Market Potential

Prioritizing Reasonable Development

Improve The Industrial System

Thank you ！

- For futher information about the China National Renewable Energy Centre then please visit:www.cnrec.org.cn

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