

*Earth’s Future*

Supporting Information for

**Rapid changes in cost of renewable-energy development and transmission of inter-regional power may accelerate the neutrality of China’s power system**

Jizhe Li1, Guohe Huang2\*, Jiapei Chen3, Chengyu He4, Yongping Li1

1 State Key Joint Laboratory of Environmental Simulation and Pollution Control, School of Environment, Beijing Normal University, Beijing 100875, China

2\* State Key Joint Laboratory of Environmental Simulation and Pollution Control, CEEER-URBNU, College of Environment, Beijing Normal University, Beijing 100875, China

3 Institute for Energy, Environment and Sustainable Communities, University of Regina, Regina, Saskatchewan S4S 0A2, Canada

4 School of Environment, Tsinghua University, Beijing 100084, China

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Interval Linear Programming.

On the basis of the interactive two-step solution algorithm, an interval linear programming model can be presented as follows:

(1a)

subject to:

(1b)

(1c)

where , , , ; denotes a set of interval numbers; , , and . An interval number is defined as .

To solve model (1), the original ILP model can be converted into two linear programming (LP) sub-models which correspond to the lower and upper bounds of the objective-function value. In detail, for interval coefficients in the objective function, the former coefficients are assumed to be positive (i.e., , for ), and latter coefficients are negative (i.e., , for ). Thus, the first sub-model would correspond to . It can be formulated as follows (assume that and ):

(2a)

subject to:

(2b)

(2c)

(2d)

Solutions of and can be obtained through solving sub-model (2). Based on the solutions of sub-model (2), the sub-model corresponding to can be formulated as follows (assume that and ):

(3a)

subject to:

(3b)

(3c)

(3d)

For model (3), solutions of and can be obtained. Thus, the final solutions of model (1) can be obtained as and .

Table S1. Fuel price for coal and natural gas.

Table S2. Investment cost of capacity expansion (TJ).

Table S3. Transmission capacity between regions (GWh).

***Large tables were uploaded separately in the file “Supporting Information (SI).xlsx”.***