

*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**

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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. Upper threshold values of transmission capacity (GWh).

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