Powerful Mathematics Editor

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E = A x r x H x PR

E = Energy output (KWh/yr)
A = Total area of PV panels
H = Annual incident solar radiation
r = Solar panel yield (~15.6%)
PR = Performance Ratio (~0.75)

$$P = \frac{1}{2}\eta A\rho v^3$$

P = Energy output (KWh/yr)
η = Efficiency
A = Sweep area of blades
ρ = Density of air
v = Average wind speed at blade height

$$v(h) \; = v_0 \frac{log(h/r)}{log(h_0/r)}$$

$\underline{Parameters:}$

$n: \ n{*}n \ map \ size$

$c_i: \ Annual \ cost \ of \ setting \ up \ plant \ on \ i^{th} \ block$
$d_i: \ Annual \ energy \ demand \ of \ i^{th} \ block's \ population$
$a_i: \ Overall \ acceptance \ of \ setting \ up \ plant \ on \ i^{th} \ block$
$p_i: \ Power \ generation \ if \ plant \ were \ set \ up \ in \ i^{th} \ block$

$n_{plants,max}: \ Max \ number \ of \ power \ plants \ to \ set \ up$
$n_{plants,min}: \ Min \ number \ of \ power \ plants \ to \ set \ up$
$a_{thresh}: \ Acceptance \ threshold \ to \ satisfy$
$p_{cap}: \ Power \ generation \ to \ not \ exceed \ (as \ ratio \ of \ demand)$

Decision Variable:

x_i : *Binary variable denoting whether or not to set up plant in i^{th} block*

Objective:

$$\min \sum_{i=0}^{n^2} c_i x_i$$

Constraints:

$$\sum_{i=0}^{n^2} p_i x_i \geq \sum_{i=0}^{n^2} d_i \quad ; \quad \sum_{i=0}^{n^2} p_i x_i \leq p_{cap} \sum_{i=0}^{n^2} d_i \quad ;$$

$$\sum_{i=0}^{n^2} x_i \geq n_{plants,min} \quad ; \quad \sum_{i=0}^{n^2} x_i \leq n_{plants,max} \quad ;$$

$$\sum_{i=0}^{n^2} (a_i - a_{thresh}) x_i \geq 0 \quad ;$$

$$y = \sum_i w_i y_i$$