METHODOLOGY

Parameter

C1
a) Sub-model?
y
b) External?
y
C2
a) Literature?
y
b) Range in forecast?
y
C3
a) Range in forecast?
y
b) Errors in forecast?
y
C4
a) (Historical) Data?
y
b) Errors in forecast?
y
C5
a) Depends on DM?
y
b) Only DM choice?
y

Data for range calculation

Range from external model
Range from literature
Range from forecast
Range from data
Information about the decision
Not uncertain or Decision variable

APPLICATION

Model of the Swiss energy system to 2035[3]

\[ c_{p} \] - PV capacity factor

C1b Sub-model: dependent on solar irradiation
C4 Range from irradiation historical data[4]

Proposed Range: [-11%, +8%]

\[ c_{ng} \] - Natural Gas price

C2 Uncertainty > $0.087\$/m³[2]
C3a EU projections range: [-38%, +31%][5]
C3a US EIA projections range: [-37%, +33%][5]
C3b EIA errors in forecasts[5]:
average ‘worst-case’ error: [-41%, +72%]
max errors: [-72%, +182%]

Proposed Range: [-41%, +72%]

CONCLUSIONS

- Methodology for uncertainty classification in strategic energy planning
- Application to example parameters

Future work:
- Application to typical strategic energy planning problem
- General classification \(\rightarrow\) pre-screening
- Link to optimization under uncertainty applications

References