

ENERGY ACCOUNTING

# RRF Mechanism

30.09.2011

B. S. Bairwa  
EE, NRPC

# Responsibility of Energy Accounting

- As per “Procedure for Implementation of the Mechanism of Renewable Regulatory Fund” para 8.1
  - ▣ All accounts related to accounting of energy from wind farm and solar generation, shall be prepared by RPC on a weekly basis, based on inputs from the concerned RLDC.

# INPUT TO RPCs

- Intra-State entities : Details of Contracts along with contracted price to the concerned RPC and RLDC through the respective SLDC.
- Regional entities : Details of Contracts along with contracted price through the respective RLDC to the concerned RPC.
- Processed data (data of scheduled generation and actual generation of wind farm/solar generator and the deviations of generation) on a weekly basis from RLDC

# Energy Accounting of Wind Generator

- No UI would be payable/receivable by Generator, if actual generation within  $\pm 30\%$  of the schedule
- UI charges for within this variation, would be settled through RRF by the host state
- For generation between  $130\%$  to  $150\%$  and below  $70\%$  of Schedule, UI will be settled between state and generator. State get settle through RRF.
- Generation above  $150\%$  of schedule, the charge payable to the wind energy generator would be the UI charge applicable corresponding to  $50- 50.02$  HZ (Presently  $155$  Paise/KWh)

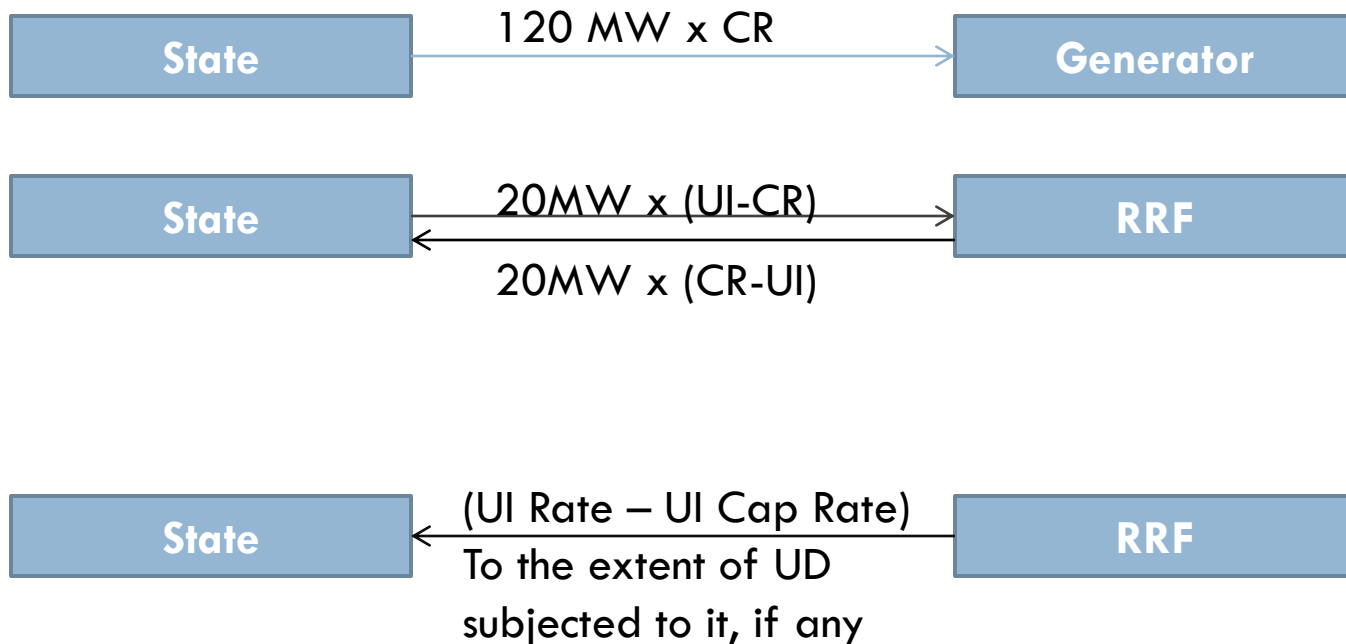
# Energy Accounting of Wind Generator (Intra-State)

- The transactions would be between the wind generator and the host State at the contracted rate for actual generation.
- The implication due to deviations of actual generation within  $\pm 30\%$  of the scheduled generation would be settled through the RRF.
- The implication due to deviations outside  $\pm 30\%$  would be settled directly between the host State and the Wind Farm

# Energy Accounting

## Wind Generator (Intra State) : Case 1

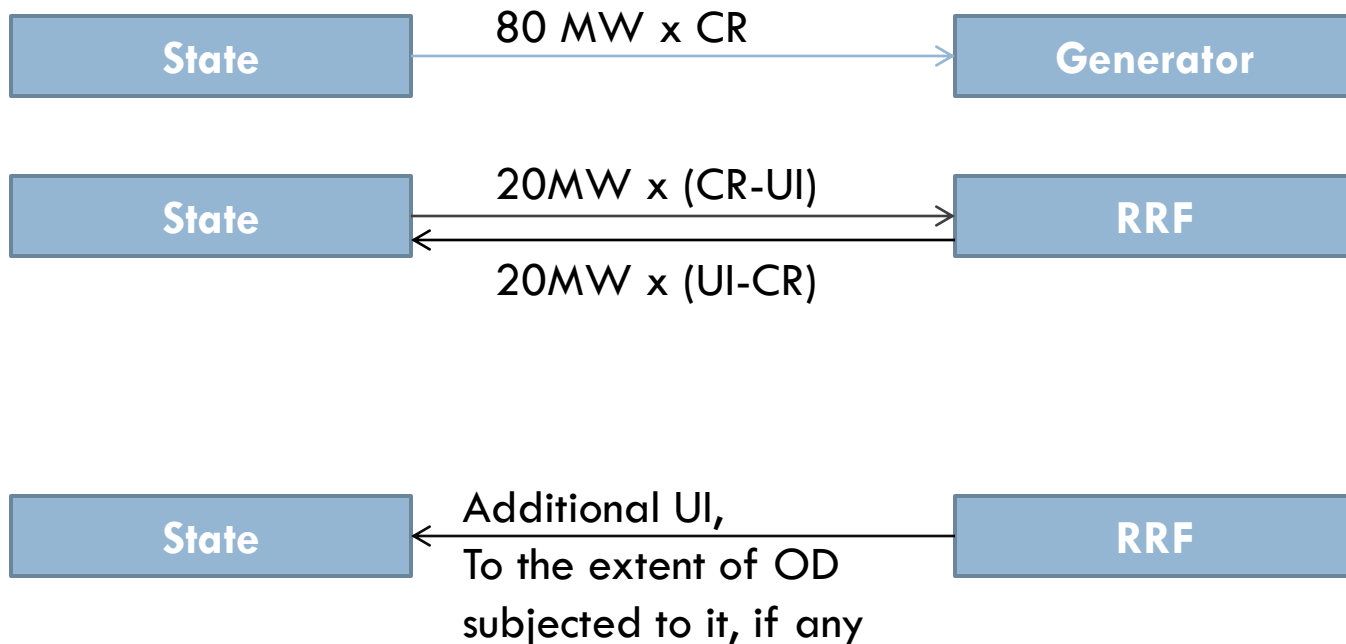
- $GS = 100 \text{ MW}$ ,  $AG = 120 \text{ MW}$



# Energy Accounting

## Wind Generator (Intra State) : Case 2

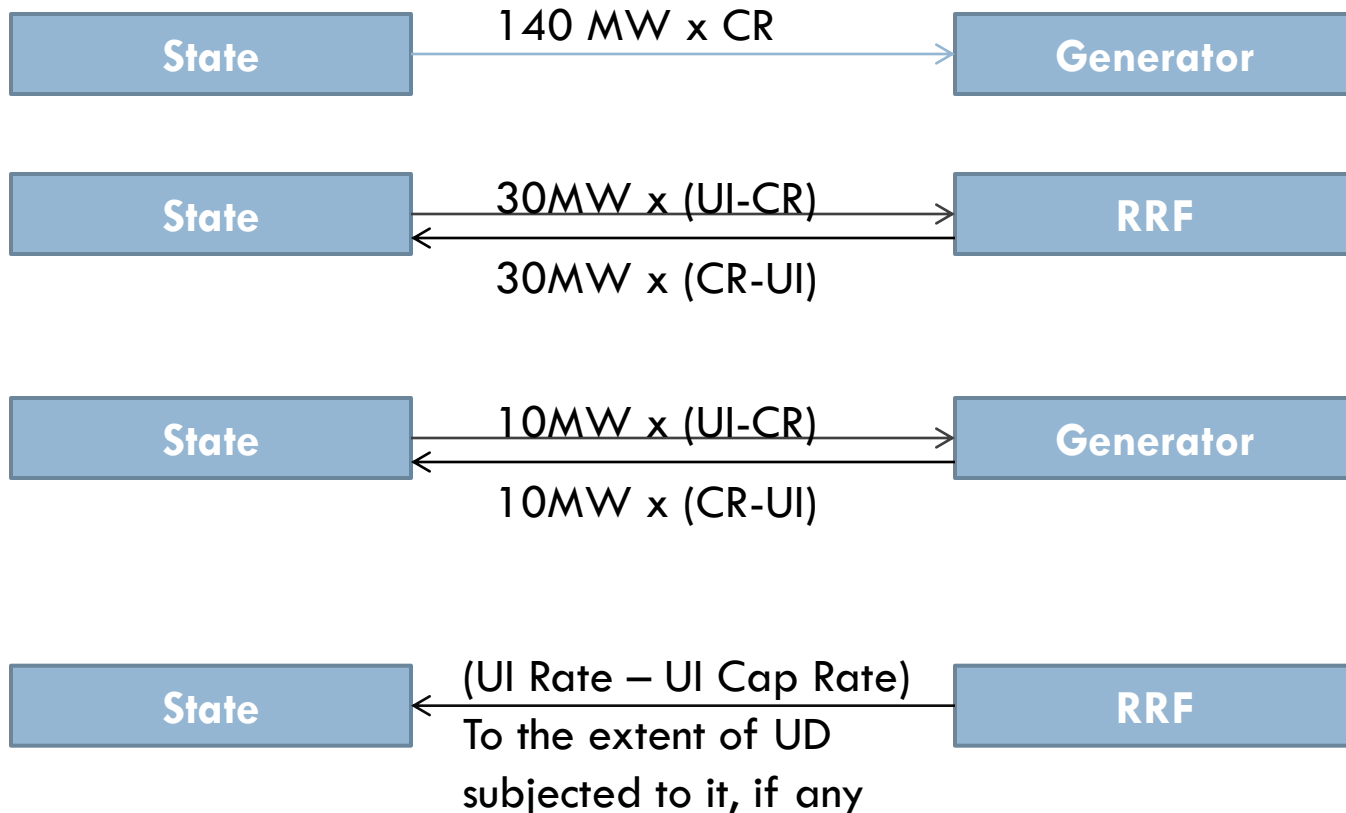
- $GS = 100 \text{ MW}$ ,  $AG = 80 \text{ MW}$



# Energy Accounting

## Wind Generator (Intra State) : Case 3

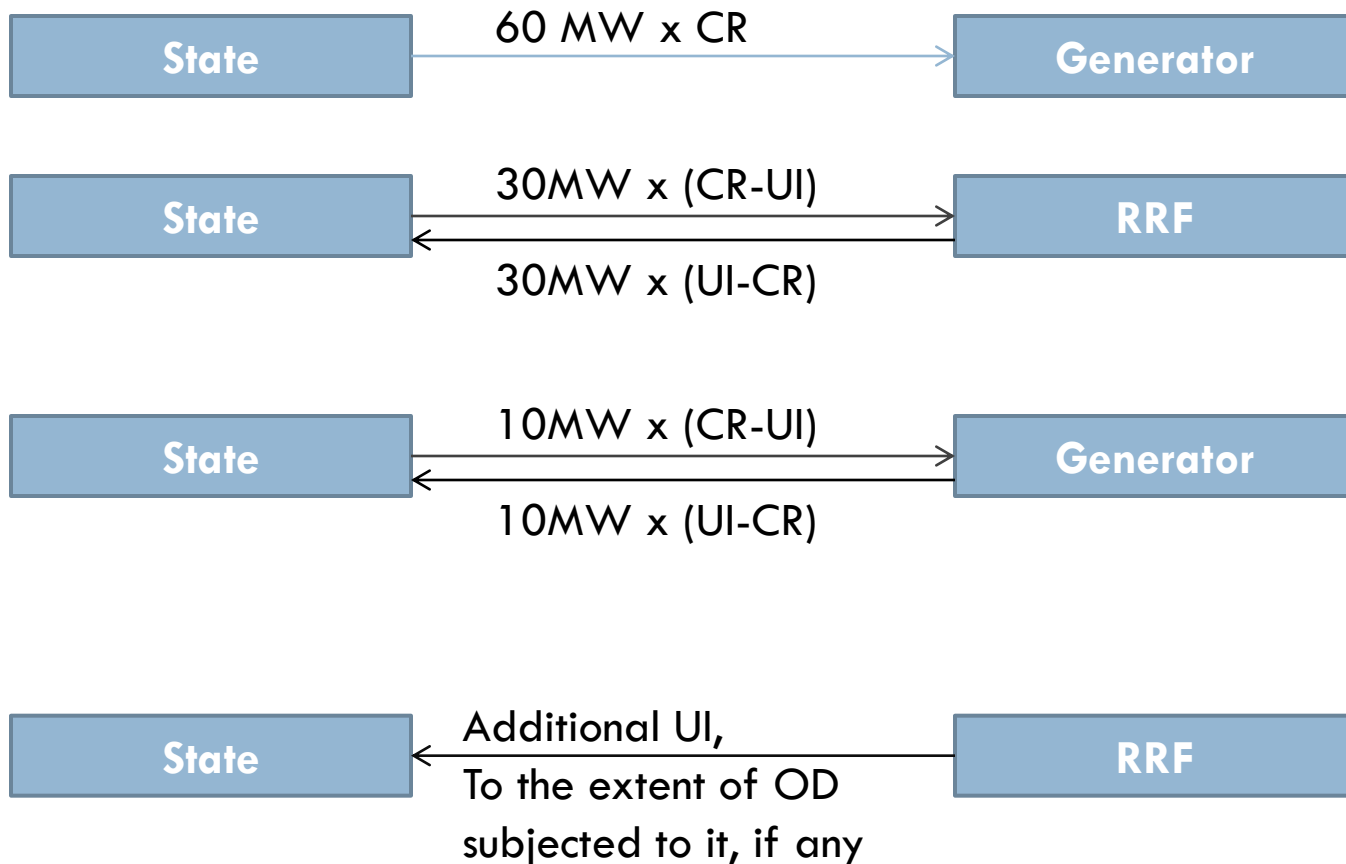
- $GS = 100 \text{ MW}$ ,  $AG = 140 \text{ MW}$



# Energy Accounting

## Wind Generator (Intra State) : Case 4

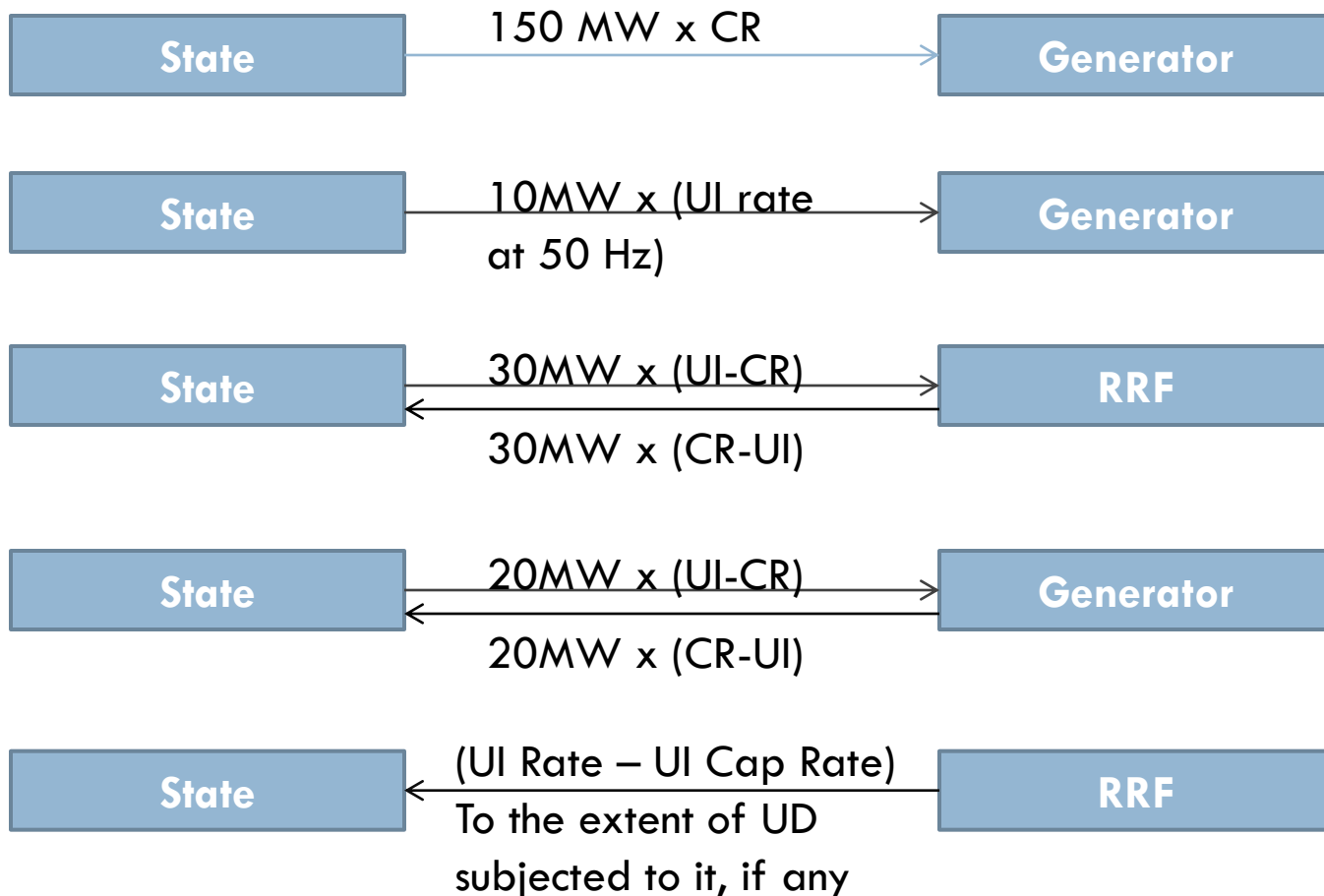
- $GS = 100 \text{ MW}$ ,  $AG = 60 \text{ MW}$



# Energy Accounting

## Wind Generator (Intra State) : Case 5

- $GS = 100 \text{ MW}$ ,  $AG = 160 \text{ MW}$



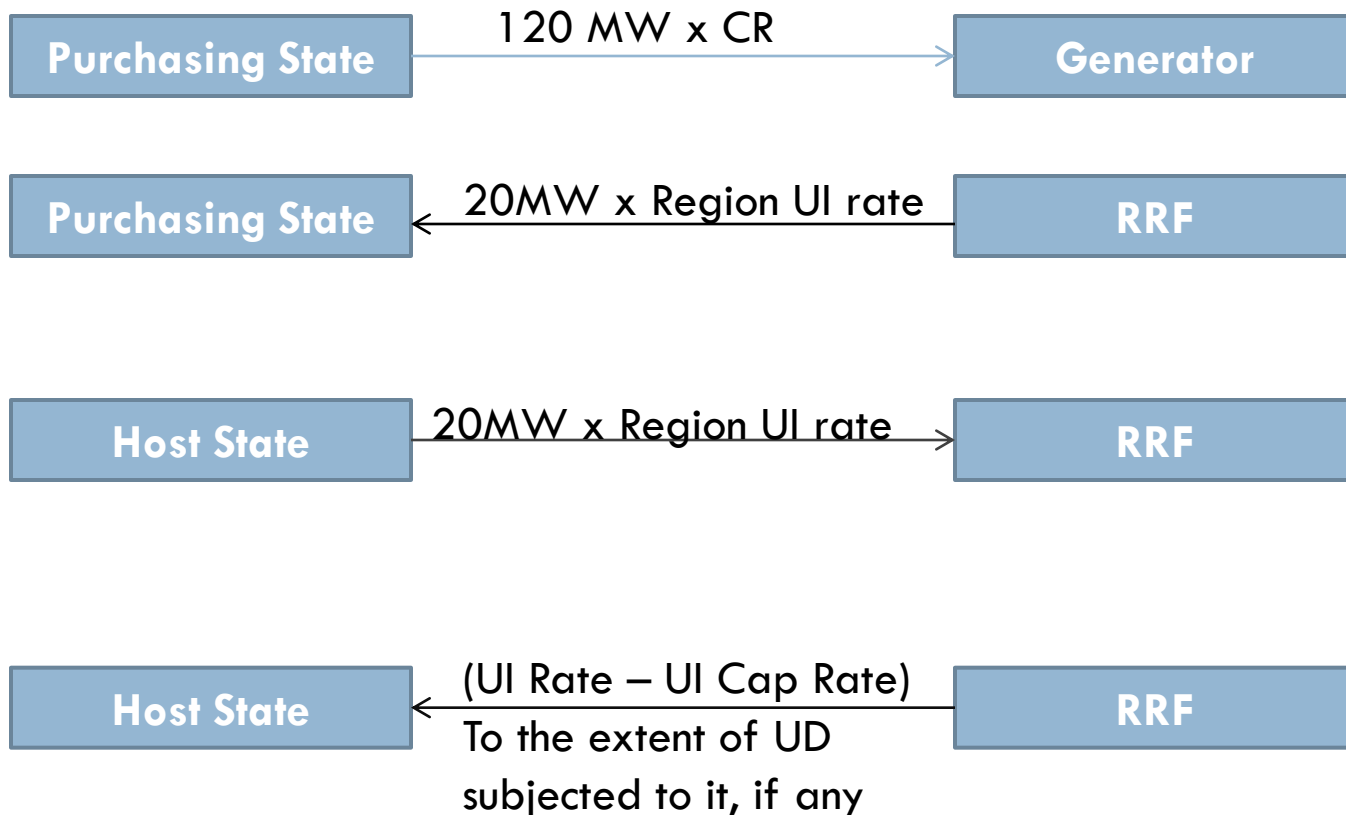
# Energy Accounting of Wind Generator (Inter-State)

- The transactions would be between the wind generator and the purchasing State at the contracted rate for actual generation upto 150% of the scheduled generation.
- The difference of actual generation from the schedule for the purchasing State would be settled at the UI rate of the Region of the purchasing State through the RRF.
- The implication due to deviations of actual generation within  $\pm 30\%$  of the scheduled generation would be settled with the host State through the RRF.
- The deviations outside  $\pm 30\%$  would be settled directly between the host State and the Wind Farm.

# Energy Accounting

## Wind Generator (Inter State) : Case 1

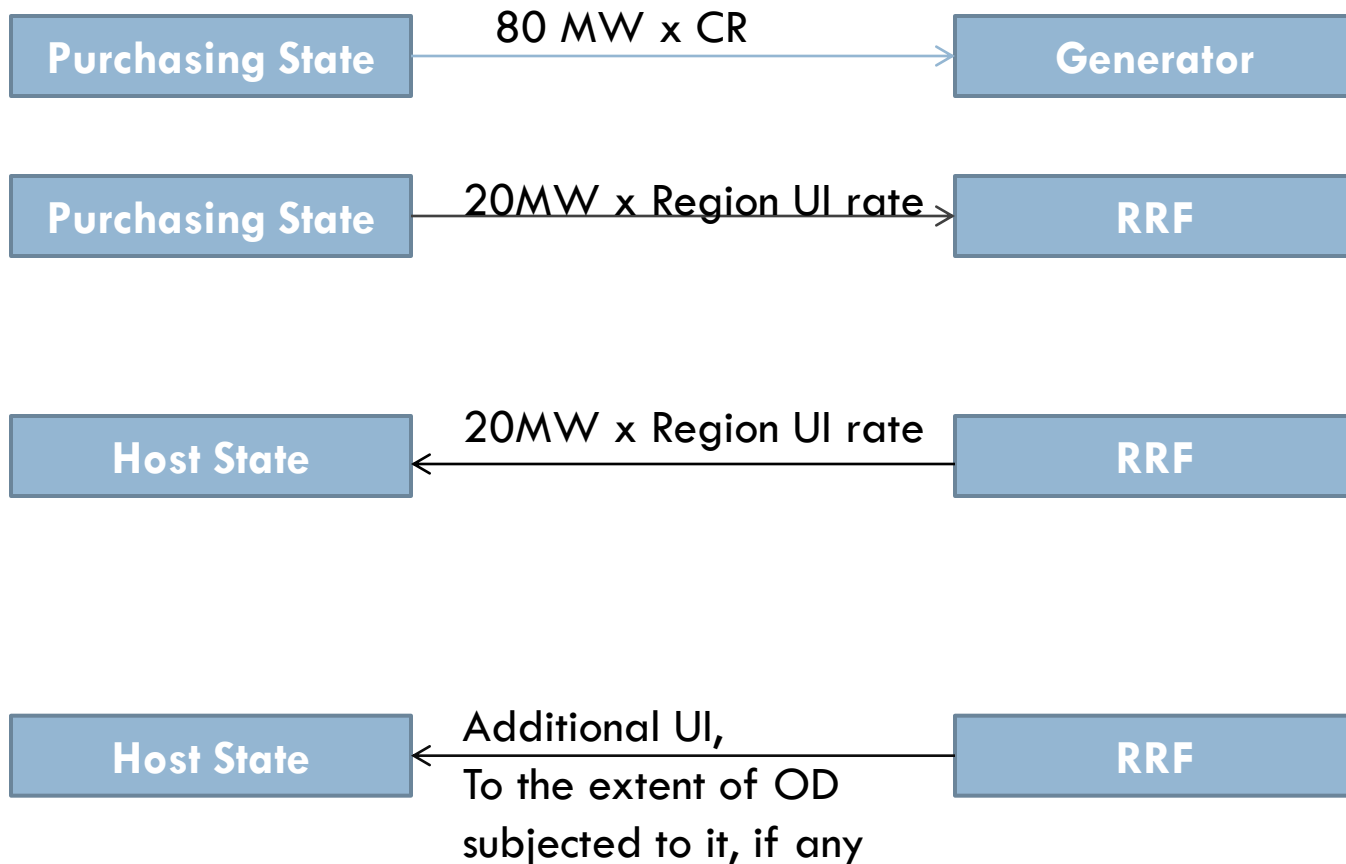
- GS = 100 MW, AG=120 MW



# Energy Accounting

## Wind Generator (Inter State) : Case 2

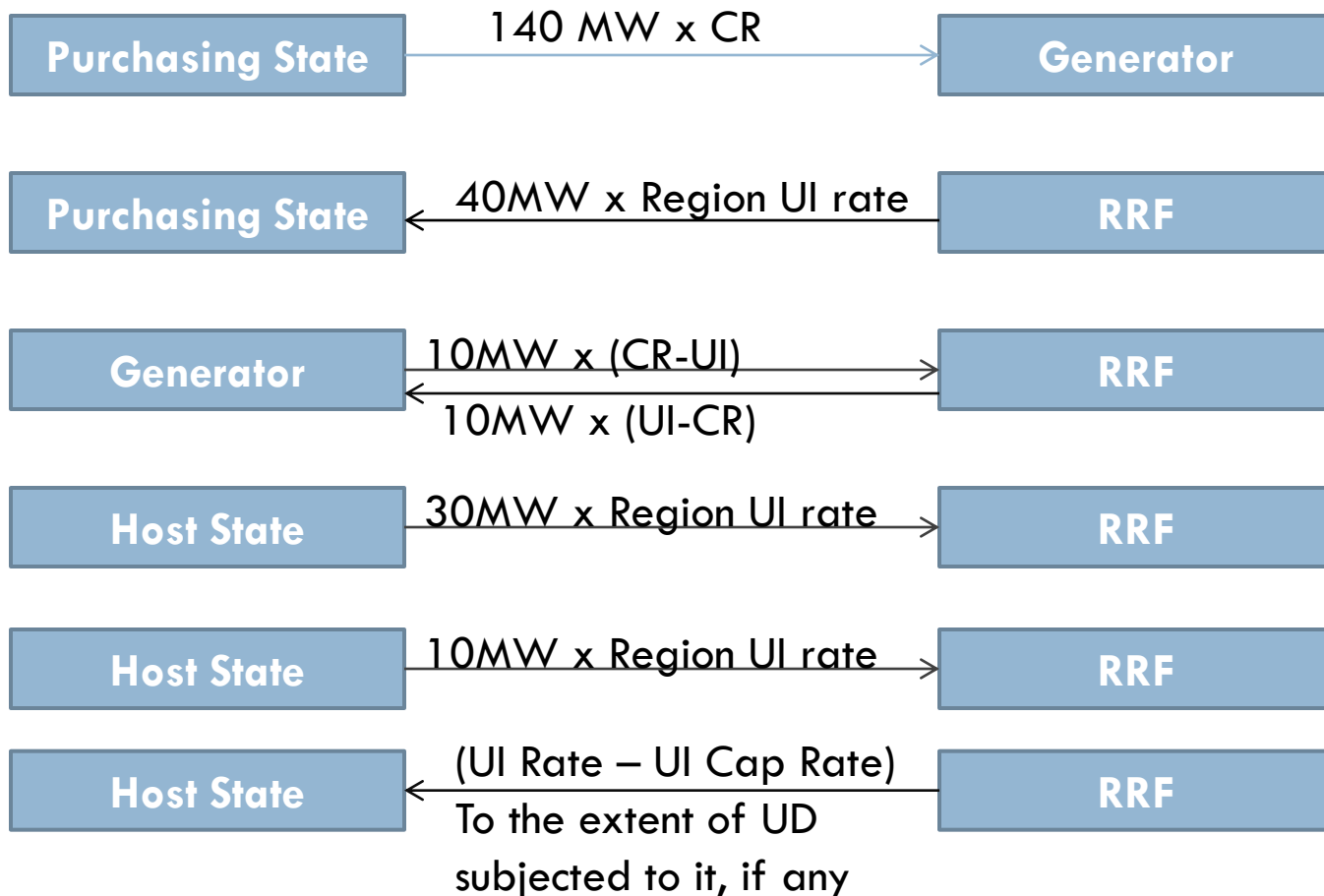
- $GS = 100 \text{ MW}$ ,  $AG = 80 \text{ MW}$



# Energy Accounting

## Wind Generator (Inter State) : Case 3

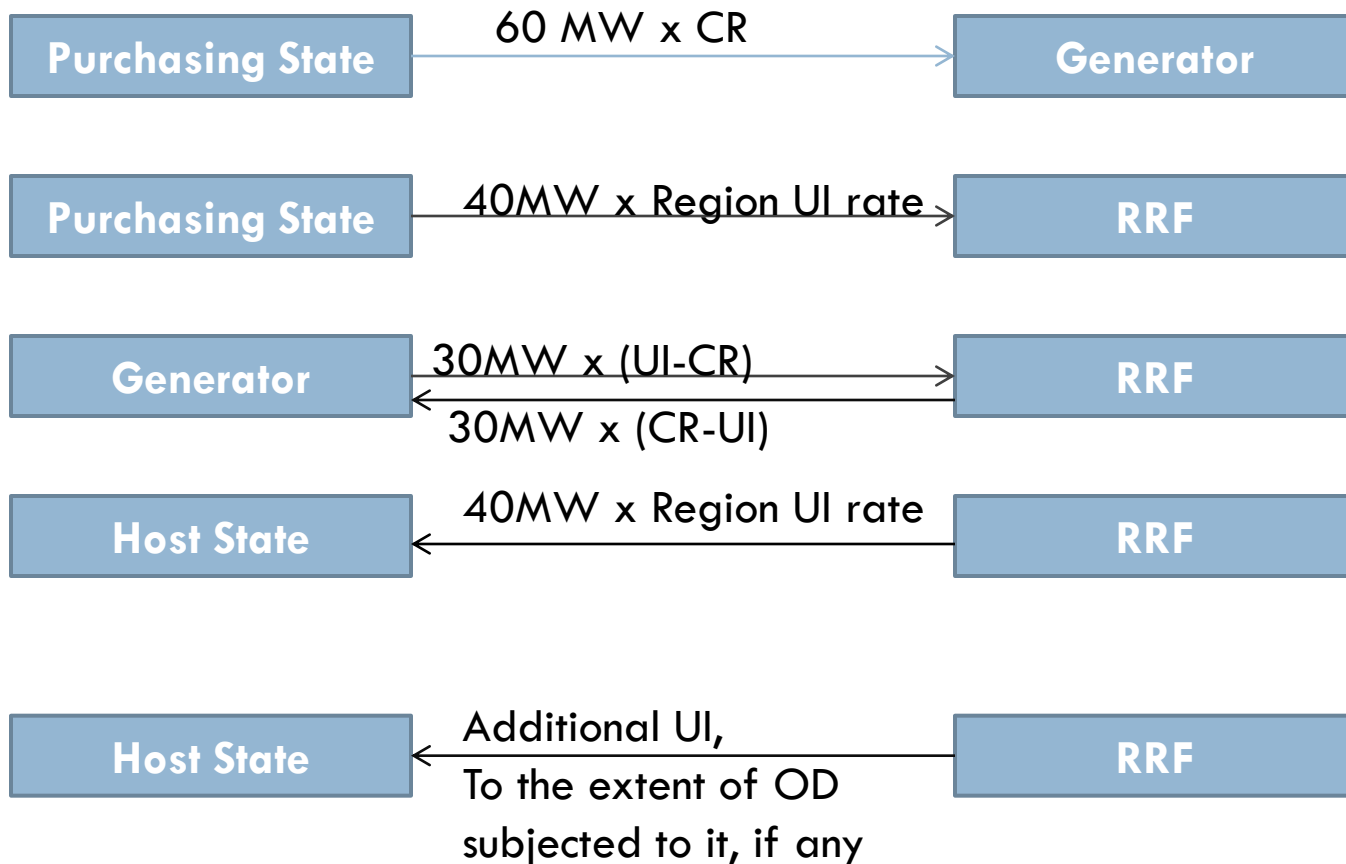
- GS = 100 MW, AG=140 MW



# Energy Accounting

## Wind Generator (Inter State) : Case 4

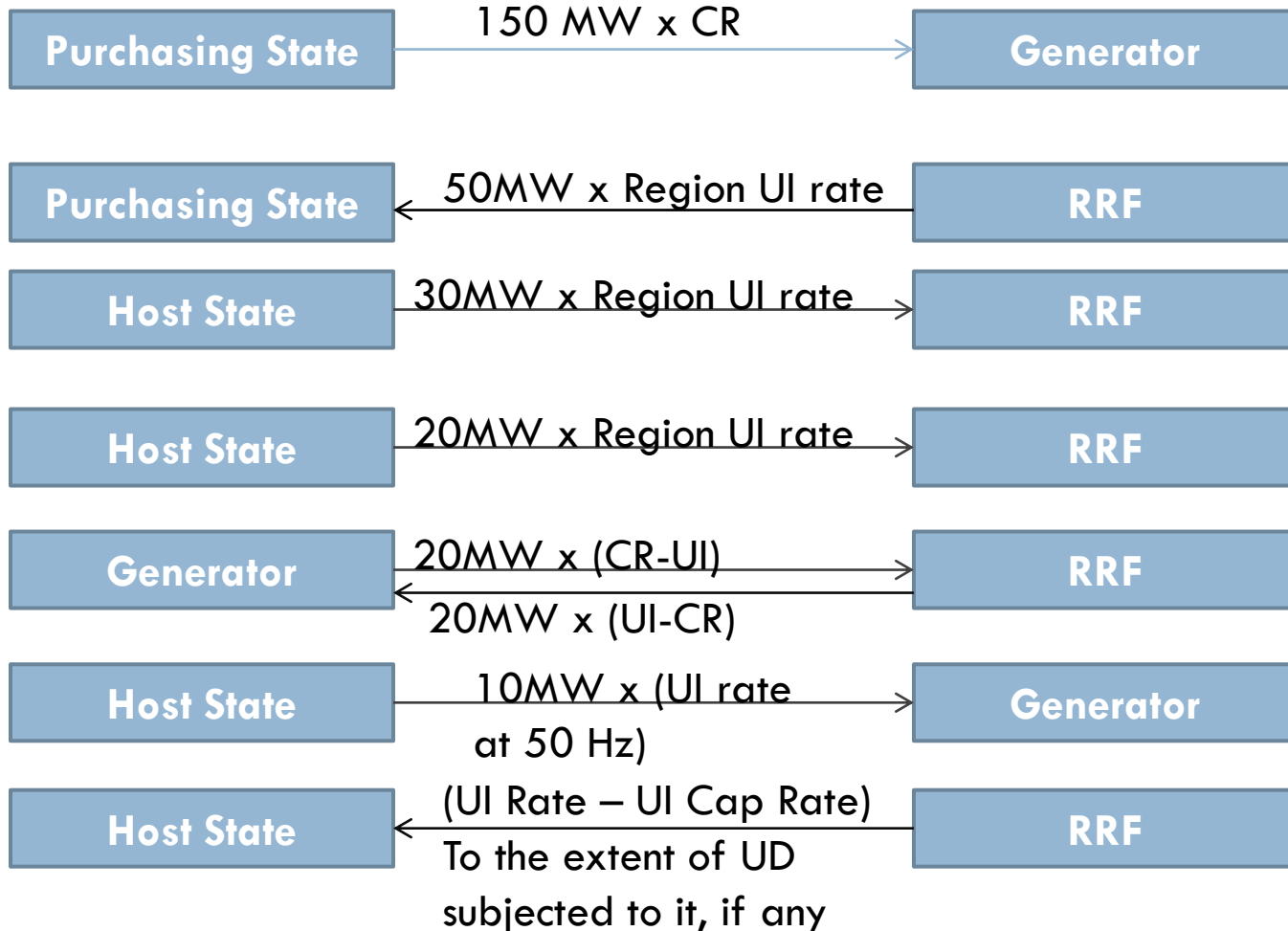
- GS = 100 MW, AG=60 MW



# Energy Accounting

## Wind Generator (Inter State) : Case 5

- GS = 100 MW, AG = 160 MW



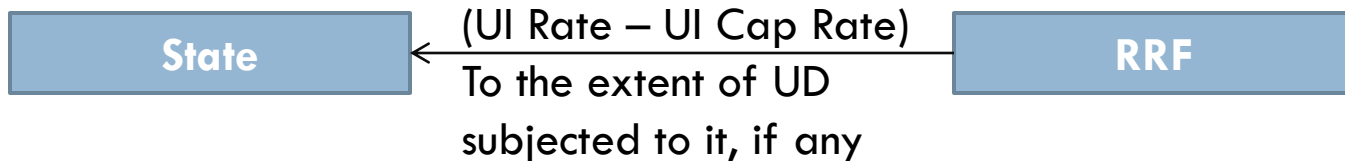
# Energy Accounting of Solar Generator

- No UI would be payable/receivable by Generator
- In the case of intra-State sale of solar energy, the host State would pay the solar generator at the contracted rate for actual generation.
- In the case of inter-State sale of solar energy, the purchasing State would pay the solar generator at the contracted rate for actual generation. The implication of UI charges due to the deviation for purchasing State and host State would be settled through the RRF.

# Energy Accounting

## Solar Generator (Intra State) : Case 1

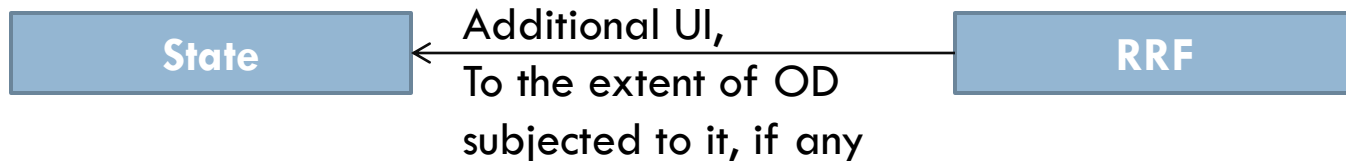
- $GS = 100 \text{ MW}$ ,  $AG = 120 \text{ MW}$



# Energy Accounting

## Solar Generator (Intra State) : Case 2

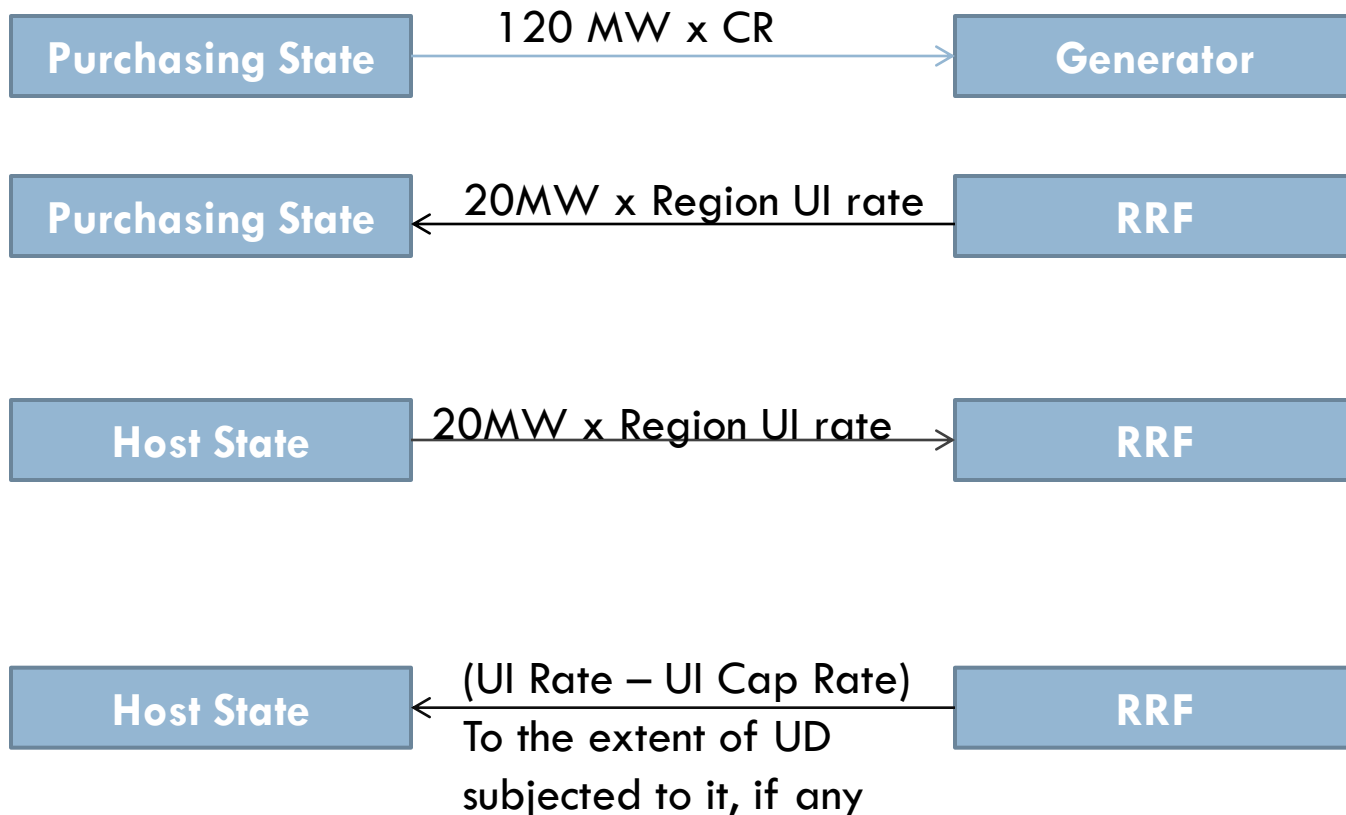
- $GS = 100 \text{ MW}$ ,  $AG = 80 \text{ MW}$



# Energy Accounting

## Solar Generator (Inter State) : Case 1

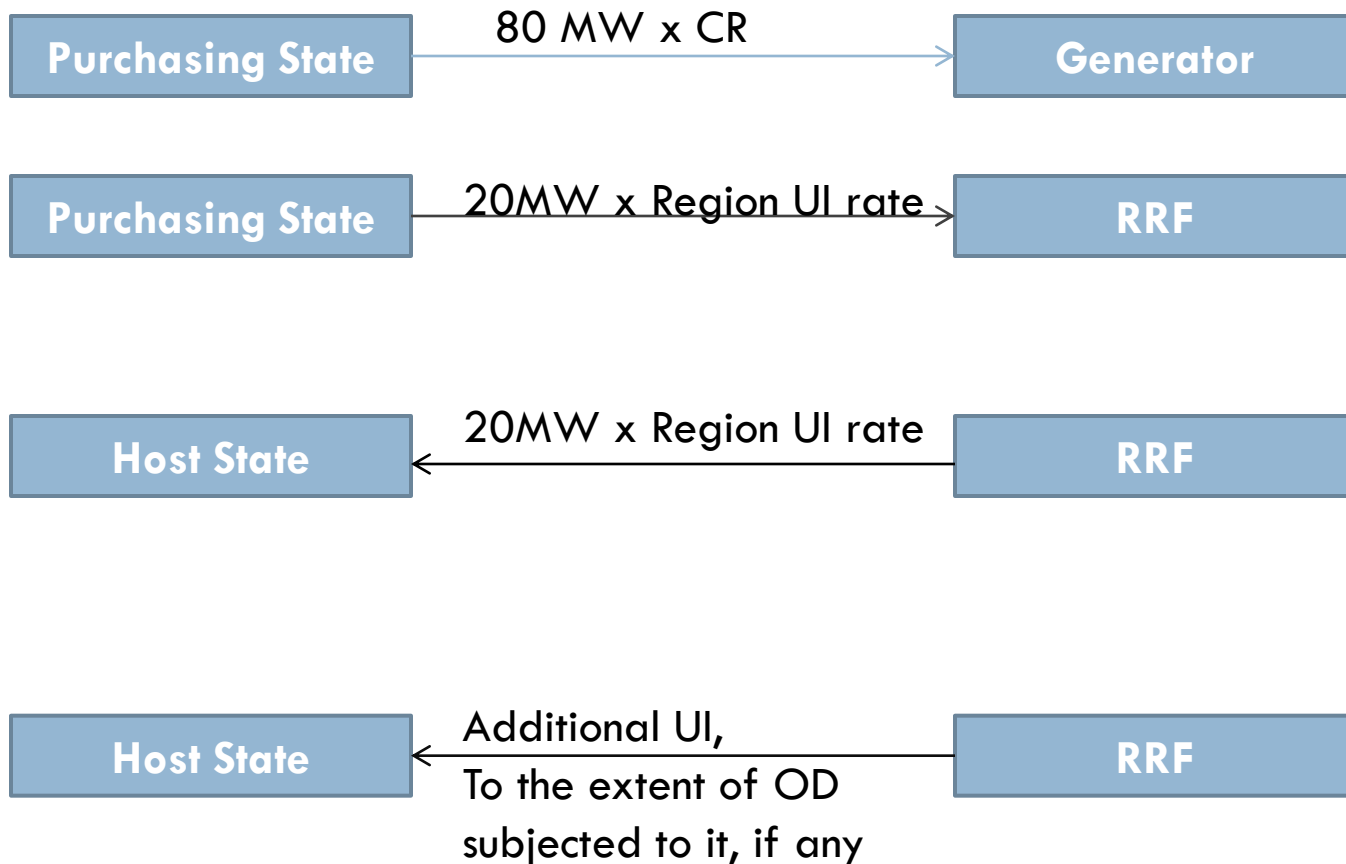
- GS = 100 MW, AG=120 MW



# Energy Accounting

## Solar Generator (Inter State) : Case 2

- GS = 100 MW, AG=80 MW



# Statement Of Energy Account

- The statement of energy account shall consist of :
  - ▣ Energy charges at contract rate to be payable by states to the generators.
  - ▣ Charges payable/receivable by states to/from RRF
  - ▣ Charges payable/receivable by generators to/from states, on account of difference between lower limit of schedule after which wind farm is responsible and actual generation

# Statement Of Energy Account

- Charges payable/receivable by states to/from RRF consist of :
  - UI charge settlement of wind generators within +/-30% of schedule
  - Charges receivable by host state from RRF on account of the difference between the UI rate and the cap UI rate for under-drawal beyond the percentage prescribed in the UI Regulations, to the extent of under-drawal subjected to it, if any, on account of net over-generation by solar and wind farms in the State as a whole.
  - Charges receivable by host state from RRF for total or part difference between the total schedule and total actual generation of solar and wind generation collectively in the state as a whole @ additional UI rate, to the extent subjected to it, if any, on account of net solar and wind farm under-generation for the State as a whole.

# Schedule of Payments

- Constituent have to pay the indicated amounts within 10 (ten) days of the issue of the accounts by the Secretariat of the respective RPCs
- If payments delayed by 2 days, defaulting constituent shall have to pay simple interest @ 0.04% for each day of delay
- All payments to the wind farm or solar generation/ purchasing State/host State entitled to receive any amount from the Renewable Regulatory Fund shall be made within 2 working days of receipt of the payments into the “Renewable Regulatory Fund”.
- The net leftover amounts in the RRF, whether positive or negative, which is to be shared among all the States/UTs of the country/DVC in the ratio of their peak demands met, on a monthly basis,

# Issues in Energy Accounting

- Will the generators selling partly through collective transactions and partly as bilateral contract, be covered in RRF mechanism ?
- Data (Schedule & Actual generation) of other Region Wind generators may be required. There should be only one agency for supplying data to one RPC.

# Issues in Energy Accounting

- The account under RRF mechanism can be issued only after preparation of UI account. Further, any revision in UI account may require revision in RRF energy account also.
- If a wind generator generates above 150% of schedule, the excess energy will be paid @ UI rate at 50Hz to the generator. But the host state enjoy the UI rate. Is it intentional?

# Issues in Energy Accounting

- Is there any possibility of capacity expansion in wind plant? If yes, then the methodology to be cleared if the plant already have the PPA for initial capacity.
- The generators will get their energy charges after 20 or more days.



**THANKS**

# Settlement of Accounts

- Sale of power to two or more States, the deviation of actual generation from the schedule : proportion to the shares of the States in the generation of the Wind Farms/Solar Generators.
- The host State will receive compensation from the RRF for total or part difference between the total scheduled generation and total actual generation of solar and wind generation collectively in the State as a whole @ additional UI rate, to the extent subjected to it, if any, on account of net solar and wind farm under-generation below the frequency specified in the CERC (Unscheduled Interchange and related matters) Regulations, for the State as a whole.

# Settlement of Accounts

- The Host State would also receive from the RRF, the difference between the UI rate and the cap UI rate for under-drawal beyond the percentage/MW prescribed in the UI Regulations, to the extent of under-drawal subjected to it, if any, on account of net over-generation by solar and wind farms in the State as a whole.