iCAROS phase 1 Complex RD Energy Bid submission

Implementation guide

09/03/2023 | Training SA

Agenda for today

Recap of last session

Specificities for RD bids

Complex bidding for RD Energy bid submission:

- How to link bids within a same QH: Exclusive groups
- How to link bids across QH: Conditional linking

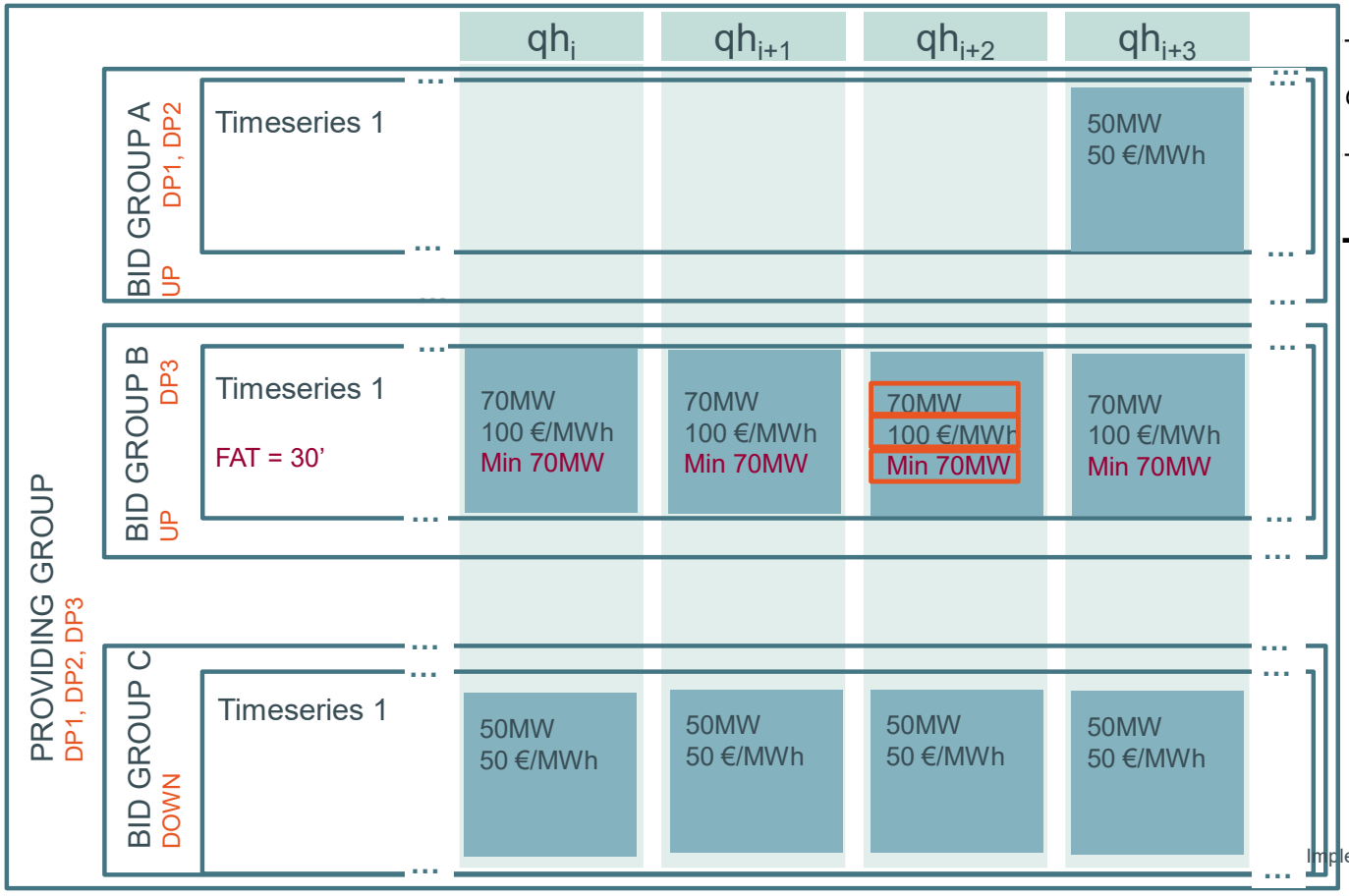
Examples:

- Complex biddings
- Full Activation Time
- Minimum Activation Time

Reminder

BIDDING STRUCTURE

Price, volume and minimum volume are defined at bid level

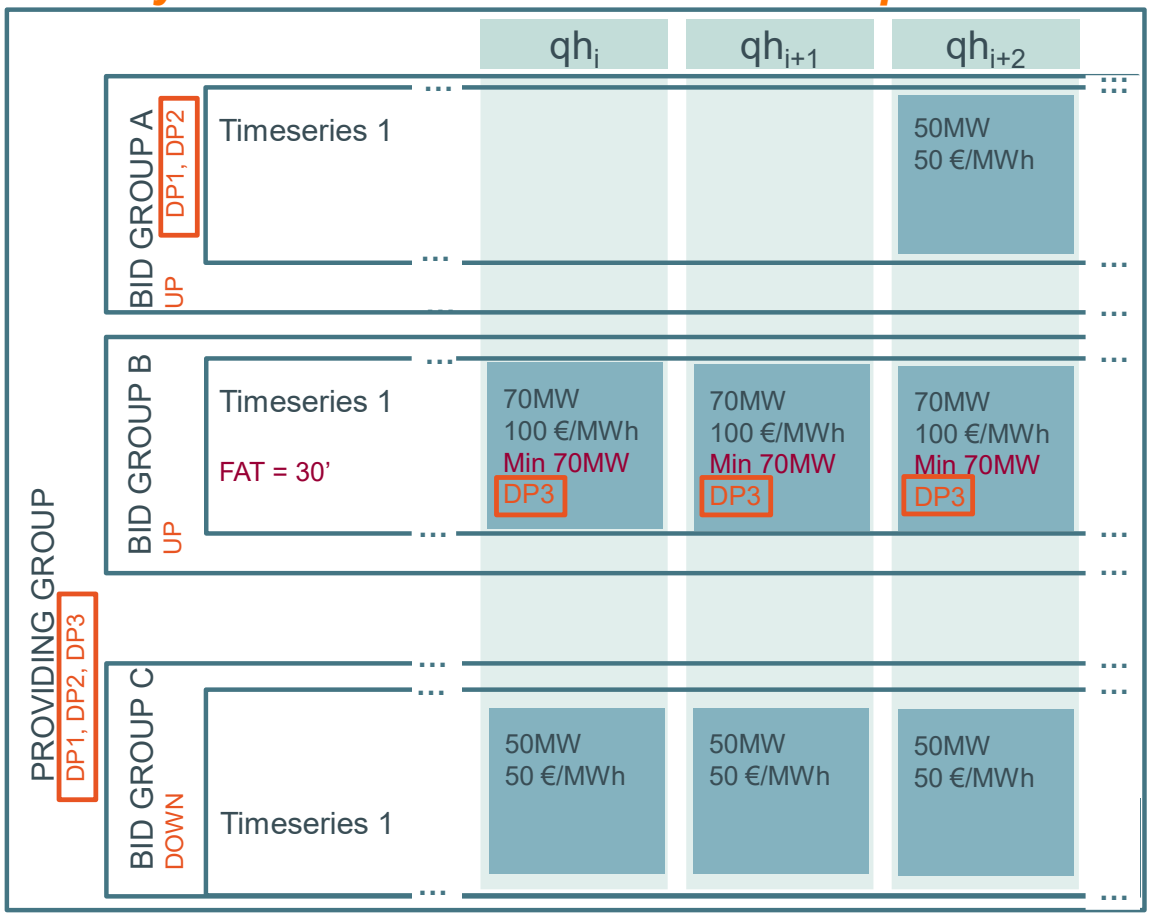


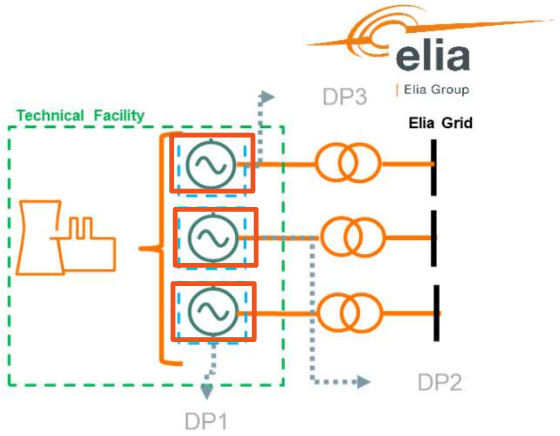
	Energy bid characteristics
Local design	ID
	List of Delivery points
	Direction
	Bid price
	Bid volume
	Minimum bid volume
	Maximum activation time
Complexe Bidding	*Quarter-hour linking (conditional links)*
	Part of exclusive group
	Part of parent/child relation
Redispatching only	Full activation time
	Minimum activation time

Reminder

BIDDING STRUCTURE

Delivery Points can be defined at multiple levels



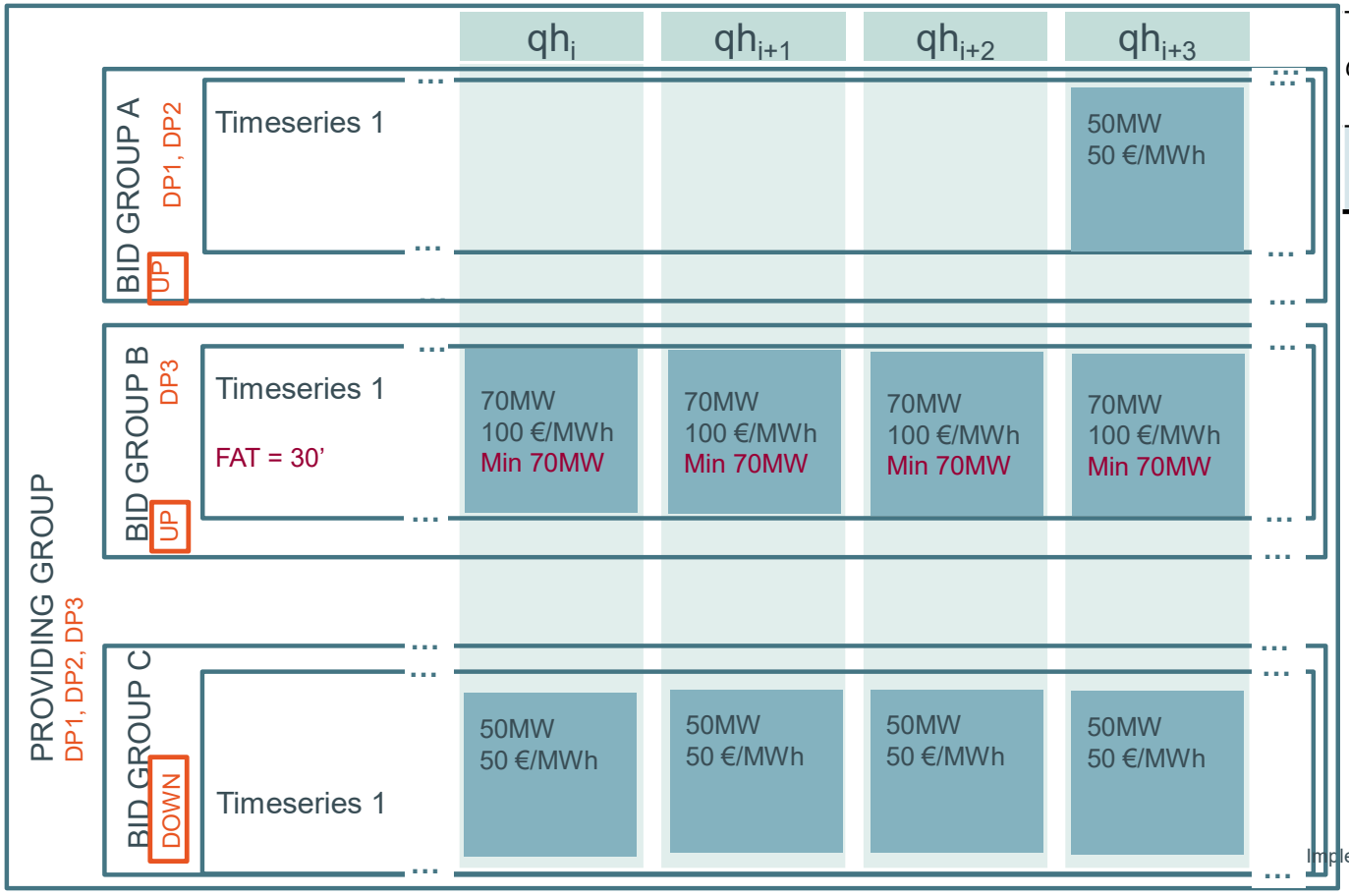


- Providing group = Technical Facility
- Bid group = Operating mode

Reminder

BIDDING STRUCTURE

Direction is defined at bid group level



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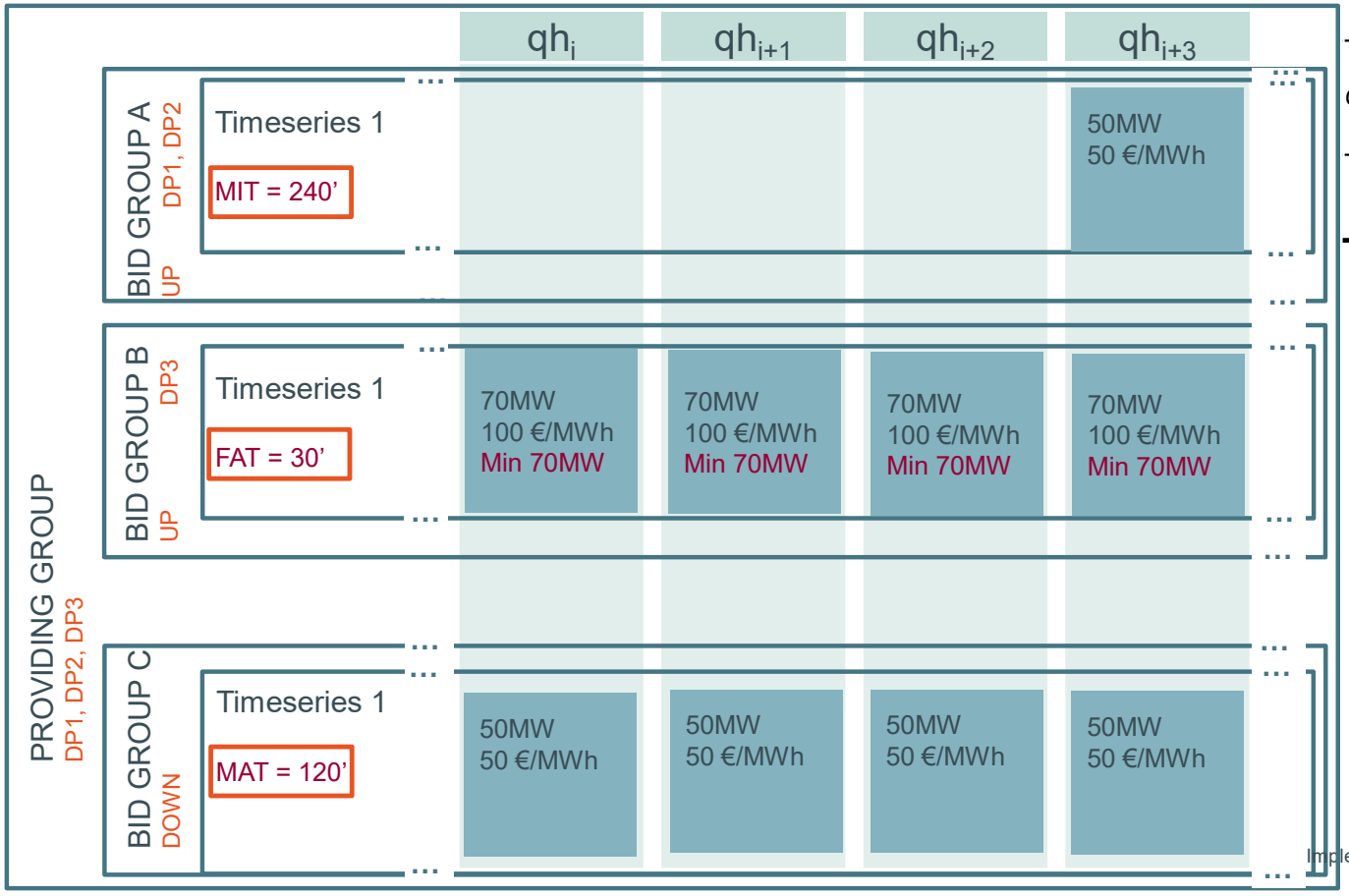
Reminder

BIDDING STRUCTURE

FAT, MAT and MIT are defined at Timeseries level*



	Energy bid characteristics
Local design	ID
	List of Delivery points
	Direction
	Bid price
	Bid volume
	Minimum bid volume
	Maximum activation time
Complexe Bidding	*Quarter-hour linking (conditional links)*
	Part of exclusive group
	Part of parent/child relation
Redispatching only	Full activation time
	Minimum activation time

* MAT design fine-tuning is part of BSP facilitation and bid structure could be updated based on it.

GOAL OF THIS SESSION

	Energy bid characteristics
Local design	ID
	List of Delivery points
	Direction
	Bid price
	Bid volume
	Minimum bid volume
	Maximum activation time
Complexe Bidding	**Quarter-hour linking (conditional links)**
	Part of exclusive group
	Part of parent/child relation
Redispatching only	Full activation time
	Minimum activation time

To explain the usage of complex bidding (conditional links, exclusive groups and combination…) to offer flexibility of DPs in different operating modes for RD

SPECIFICITIES FOR RD BIDS

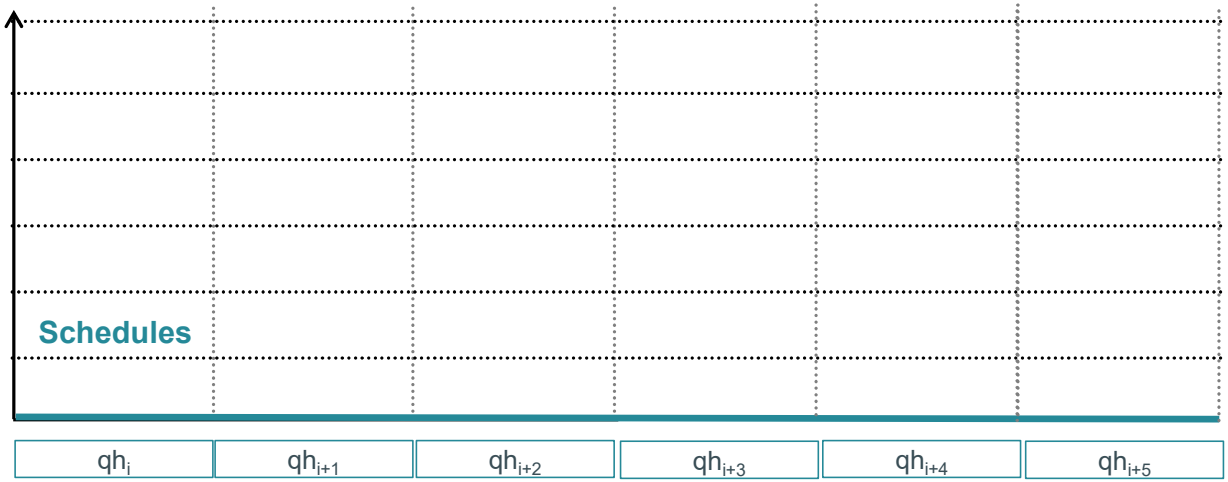
FAT

FULL ACTIVATION TIME

Example – initial situation

Initial situation (before activation)

- 1 Bid Groups with
  - DP1 initially not running (schedule = 0 MW)
  - FAT = 45 min
- All bids in these Bid Groups are available



Legend:

Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

FULL ACTIVATION TIME

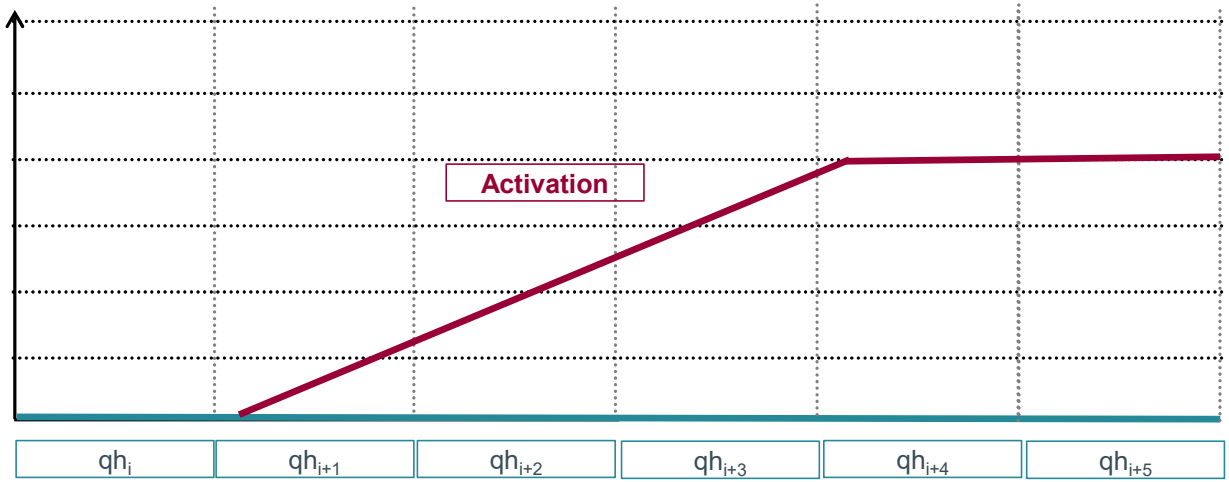
Example – initial situation

Final situation (at activation)

➔Elia activates 100 MW from qh_{i+4} to qh_{i+10}

➔ Ramp-up start 45' (=FAT) before qh_{i+10}

➔ 100 MW are reached in qh_{i+10}



Legend:

Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

HOW TO LINK BIDS WITHIN THE SAME QH

Exclusive groups & Parent-child relations

HOW TO LINK BIDS WITHIN THE SAME QH

Exclusive groups & Parent-child relation

Simple bid

Simple bids can be linked **within the same quarter hour** to form **complex bids**

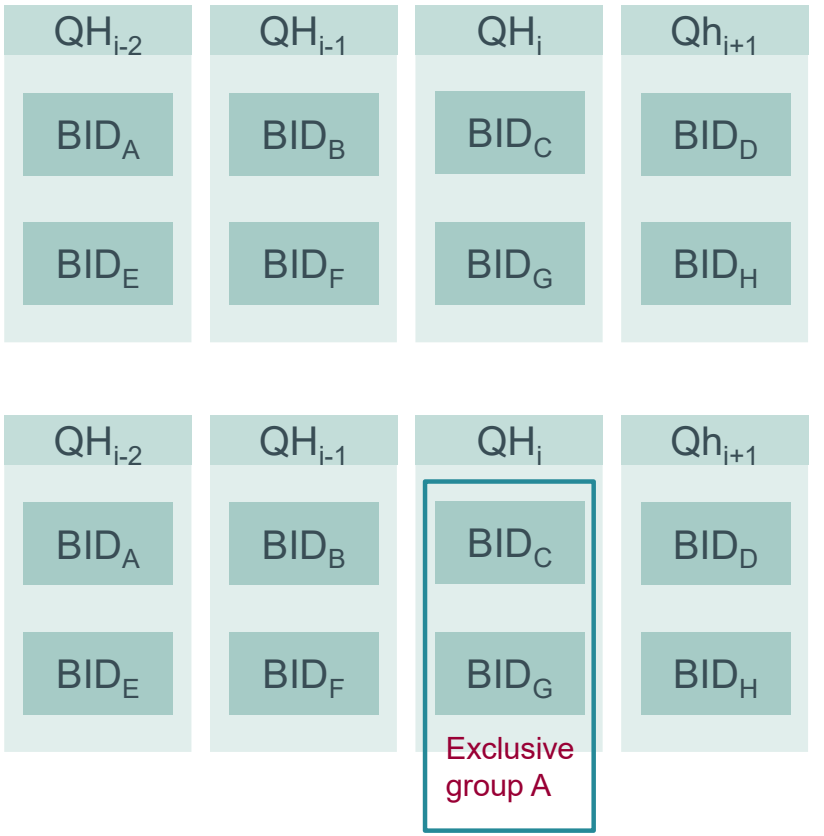
- Exclusive Group (=EG)

  Only one or none of the bids in an exclusive group can be activated simultaneously

- Parent-child relation

  The child cannot be activated if the parent has not been activated first

Bids cannot have both an exclusive bid identification and a parent-child identification

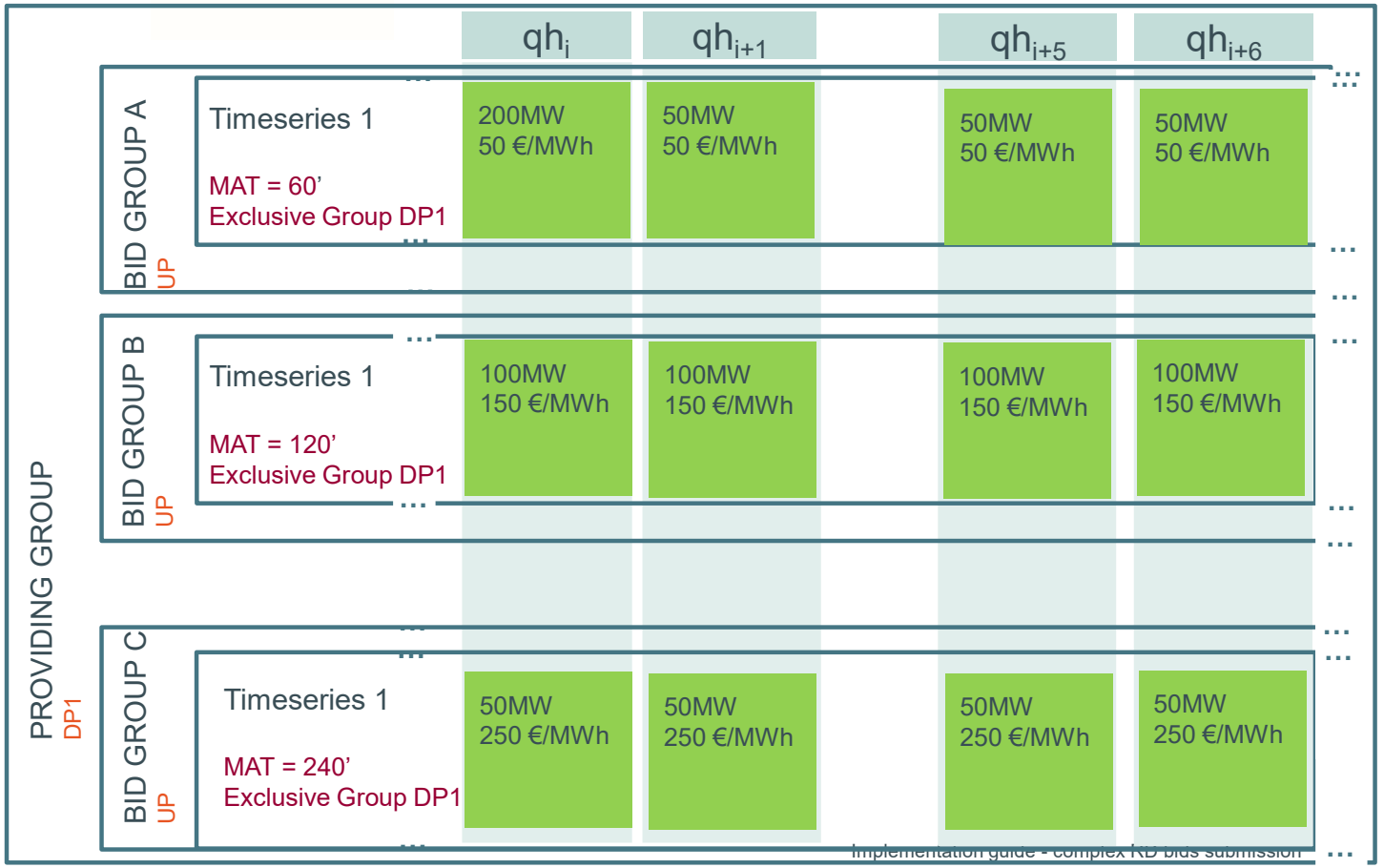


EXCLUSIVE GROUPS
Example 1/2

Initial situation (before activation)

- 3 Bid Groups with
  - same DP1
  - different MAT
  - Same Exclusive Group
- All bids in these Bid Groups are available

Only 1 bid per qh in this Exclusive Group can be activated



Legend:

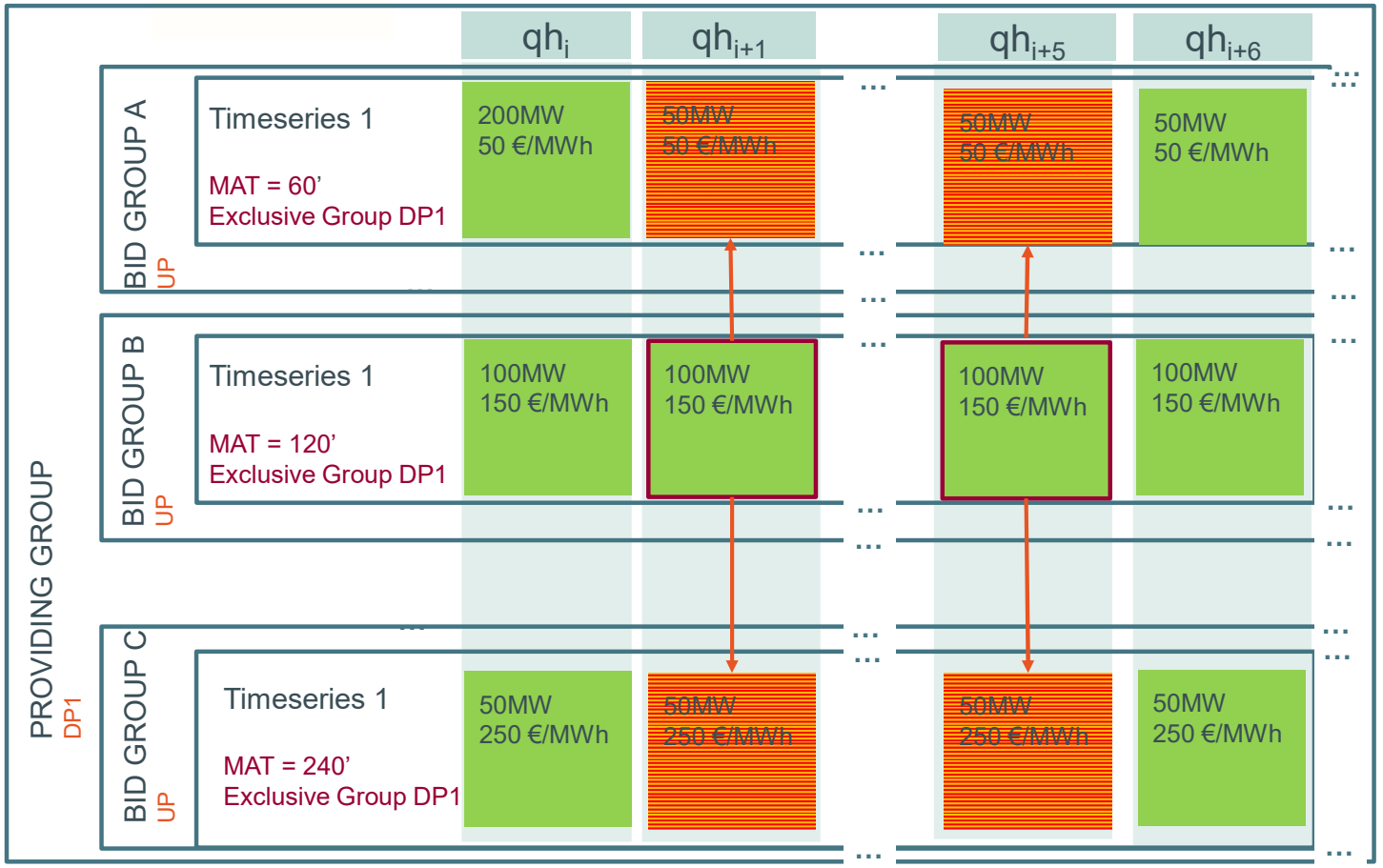
Bid **available** for selection and activation	Bid **unavailable** for selection and activation

EXCLUSIVE GROUPS
Example 2/2

Final situation (at activation)

➔ Bid Groups B is selected from qh_{i+1} to qh_{i+5}

➔ During this period all other bids in the Bid Groups of the Exclusive Group cannot be selected



Legend:

Bid **available** for selection and activation	Bid **unavailable** for selection and activation

HOW TO LINK BIDS ACROSS QH

Conditional linking

HOW TO LINK BIDS ACROSS QH

*Conditional linking**

Simple bid

Simple bids can be linked **through different quarter hour** to form **conditionally linked bids**

Maximum 6 links maximum 3 in QH-1 and 3 links in QH-2

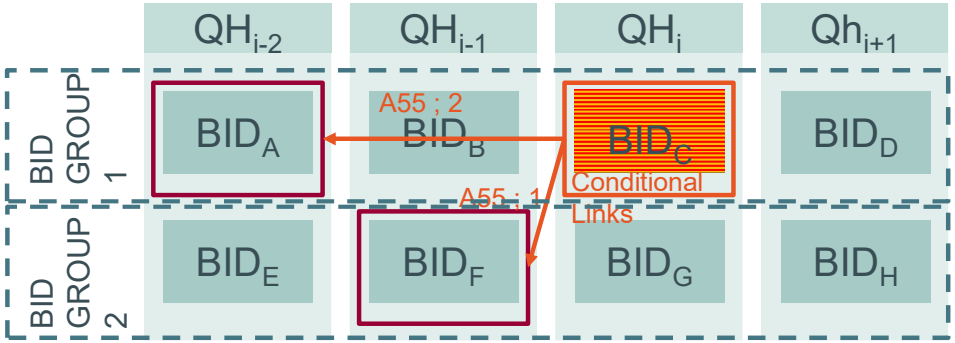
Different type of links:

A55 link: Bid initially available, becomes unavailable if linked bid activated

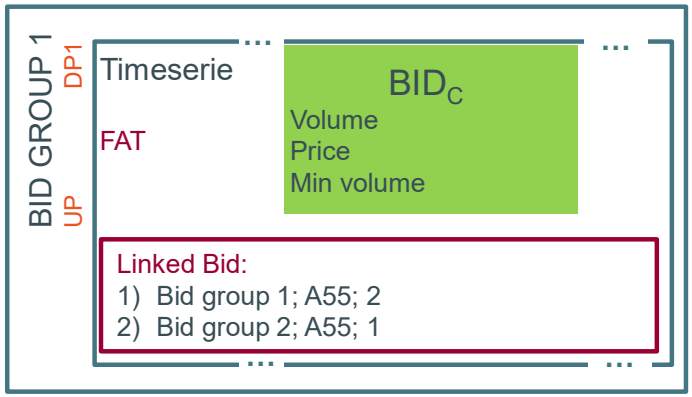
A67 link: Bid initially unavailable, becomes available if linked bid activated

A56 link : Bid initially available, becomes unavailable if linked bid not activated

A68 link: Bid initially unavailable, becomes available if linked bid not activated



Ex: Bid C is initially available and becomes unavailable
➔ if Bid Group 1 is activated in QH-2
➔ or if Bid Group 2 is activated in QH-1



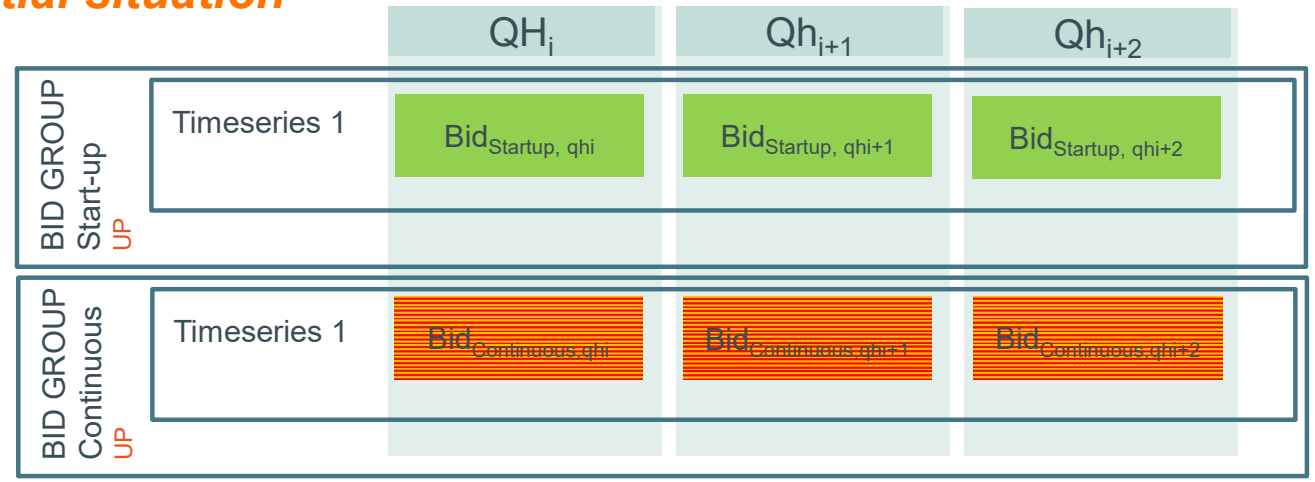
* Also called quarter-hour linking

CONDITIONAL LINKING

Example of a start-up – initial situation

DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - Must be activated during 1 qh before one Continuous bid becomes available
  - Includes the start-up time in FAT, start-up price…
  - Is initially available
- **Continuous** bid
  - Includes all properties of a running DP (FAT, price…)
  - Is initially unavailable



Legend:

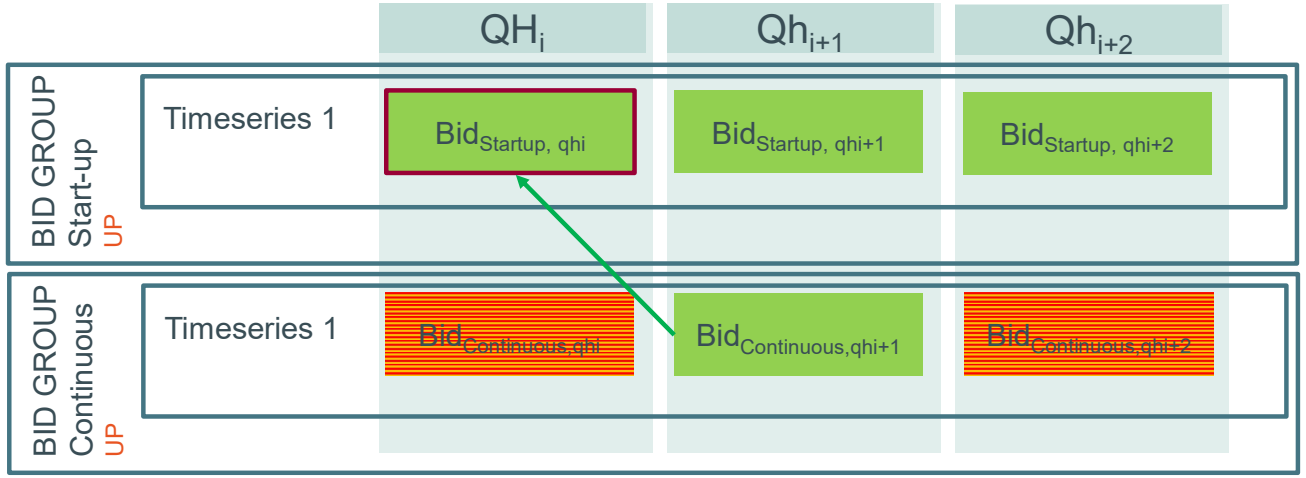
Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

CONDITIONAL LINKING

Example of a start-up – continuous bids

DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - initially available
- **Continuous** bid is
  - initially unavailable
  - Becomes available if $Bid_{Startup,\ qh-1}$ is activated: **A67 link**



Legend:

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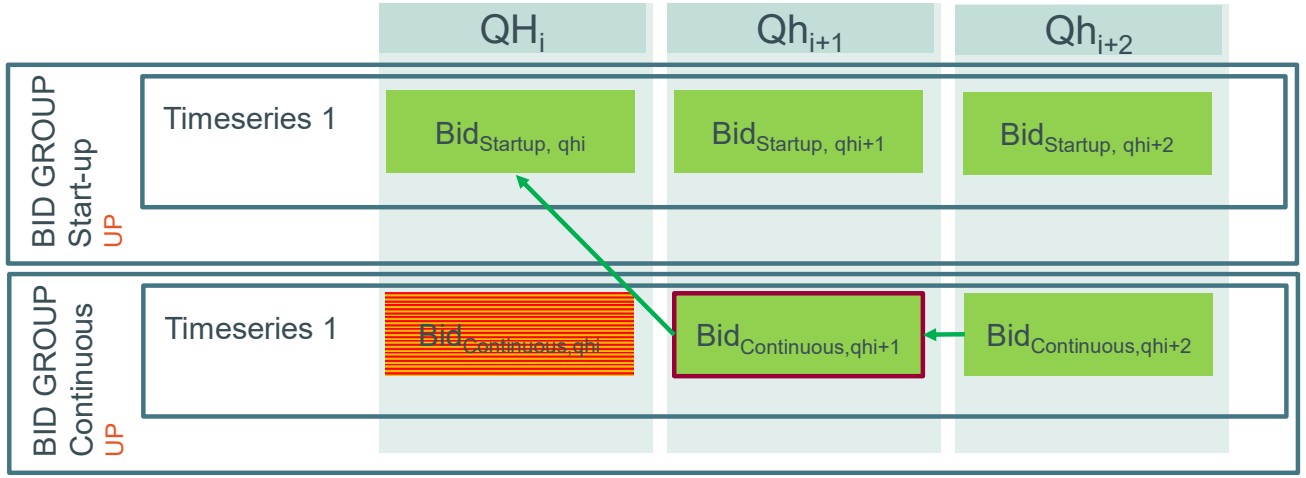
CONDITIONAL LINKING

Example of a start-up – continuous bids

DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - initially available
- **Continuous** bid is
  - initially unavailable
  - Becomes available if $Bid_{Startup,\ qh-1}$ is activated: **A67 link**
  - Or Becomes available if $Bid_{Continuous,\ qh-1}$ is activated: **A67 link**



Legend:

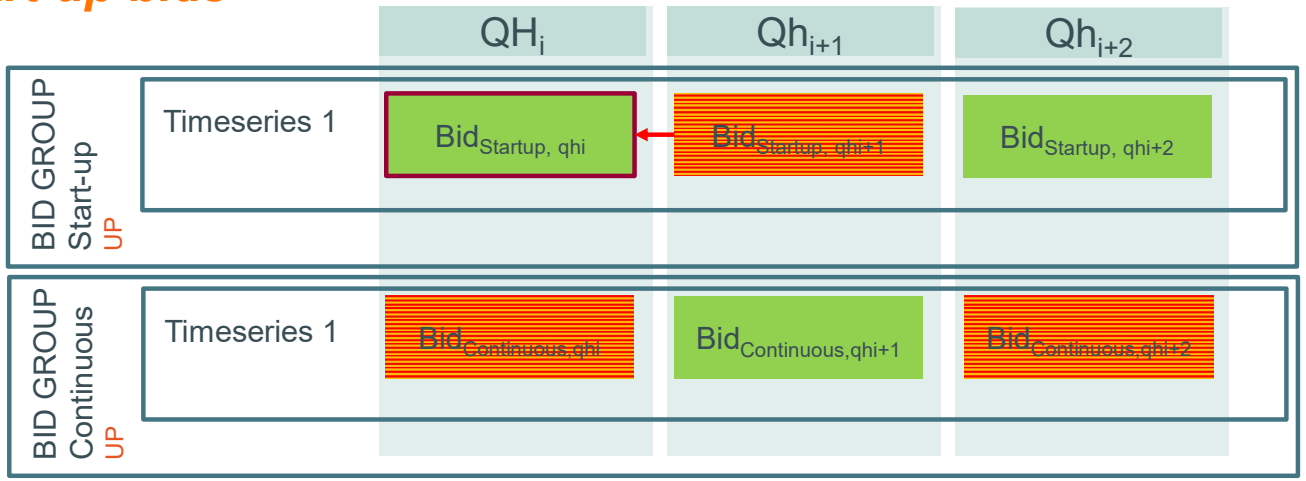
Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

CONDITIONAL LINKING

Example of a start-up – start-up bids

DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - initially available
  - Becomes unavailable if $Bid_{Startup, qh-1}$ is activated: **A55 link**
- **Continuous** bid is
  - initially unavailable



Legend:

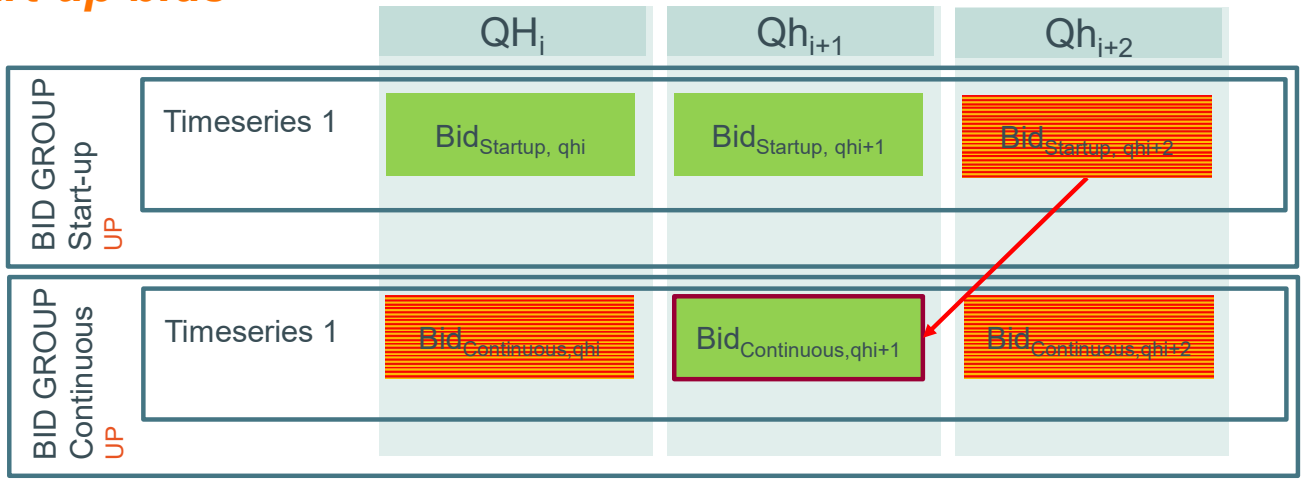
Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

CONDITIONAL LINKING

Example of a start-up – start-up bids

DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - initially available
  - Becomes unavailable if $Bid_{Startup,\ qh-1}$ is activated: **A55 link**
  - Becomes unavailable if $Bid_{Continous,\ qh-1}$ is activated: **A55 link**
- **Continuous** bid is
  - initially unavailable



Legend:

Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

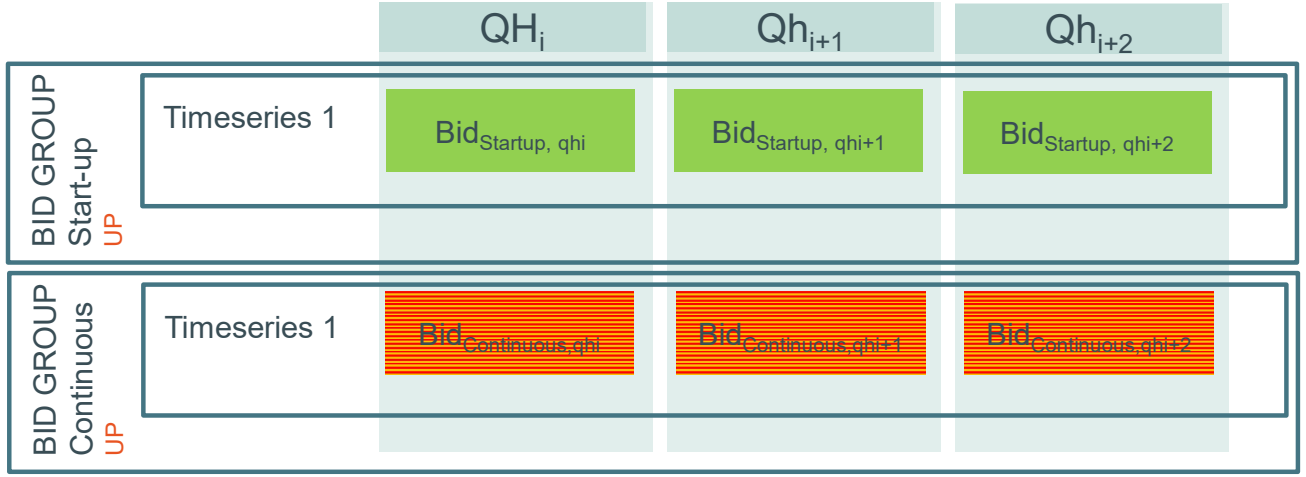
CONDITIONAL LINKING

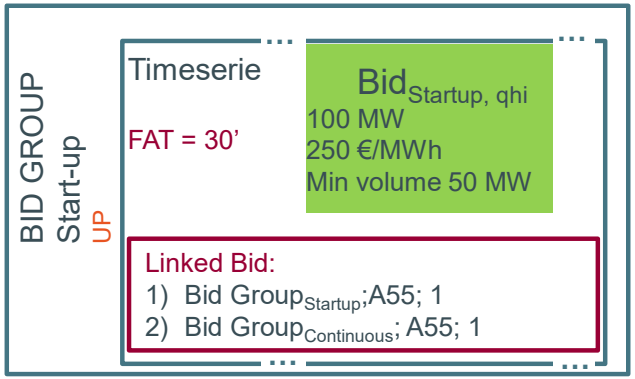
Example of a start-up – initial situation

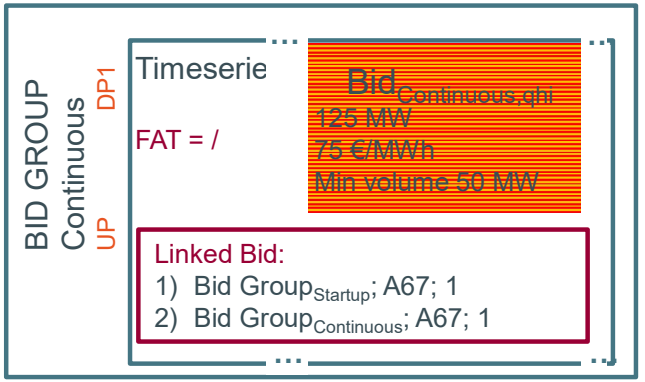
DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - initially available
  - Becomes unavailable if $Bid_{Startup,\ qh-1}$ is activated: **A55 link**
  - Becomes unavailable if $Bid_{Continous,\ qh-1}$ is activated: **A55 link**

- **Continuous** bid
  - is initially unavailable
  - Becomes available if $Bid_{Startup,\ qh-1}$ is activated: **A67 link**
  - Or Becomes available if $Bid_{Continuous,\ qh-1}$ is activated: **A67 link**





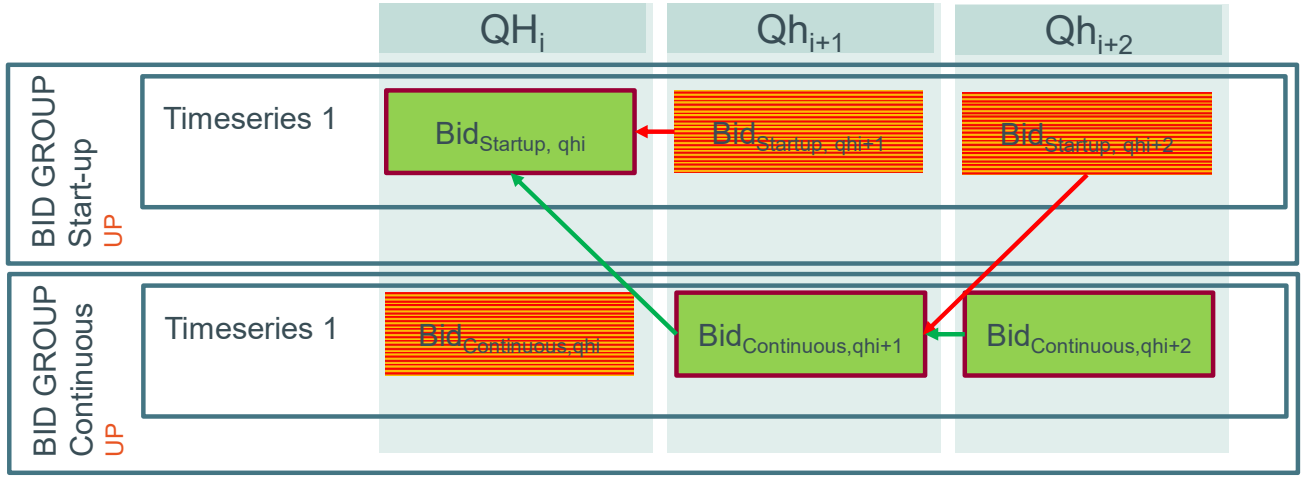


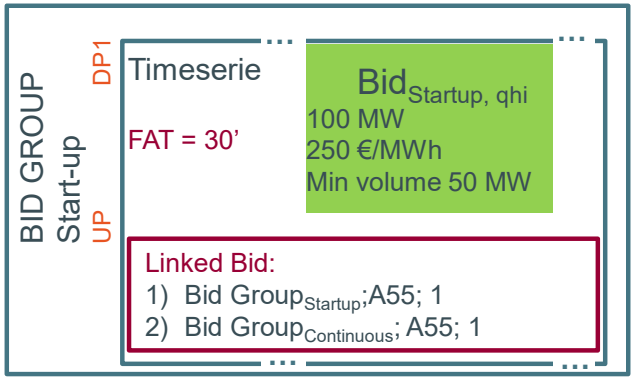
CONDITIONAL LINKING

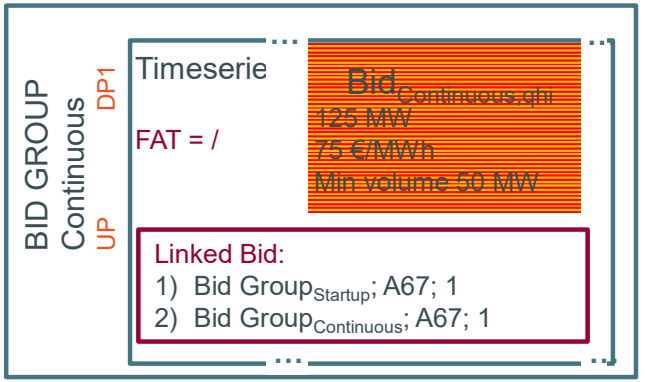
Example of a start-up – at selection/activation

DP is not running
2 Bid Groups to reflect start-ups:

- **Start-up** bids
  - initially available
  - FAT is used to reflect start-up time
  - Becomes unavailable if $Bid_{Startup,\ qh-1}$ is activated: **A55 link**
  - Becomes unavailable if $Bid_{Continous,\ qh-1}$ is activated: **A55 link**
- **Continuous** bid
  - is initially unavailable
  - Becomes available if $Bid_{Startup,\ qh-1}$ is activated: **A67 link**
  - Or Becomes available if $Bid_{Continuous,\ qh-1}$ is activated: **A67 link**







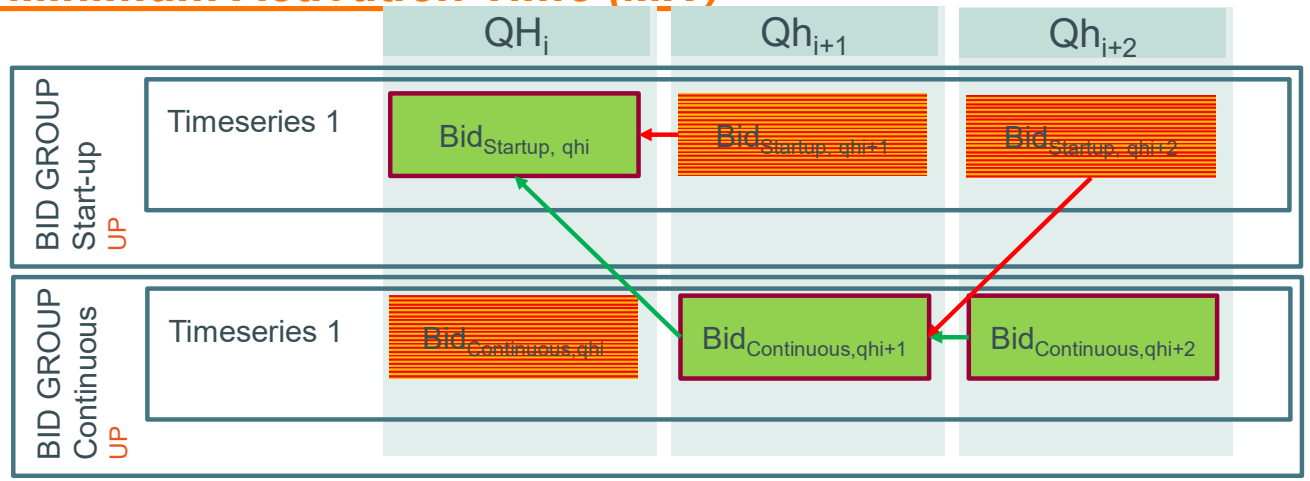
CONDITIONAL LINKING

Example of a start-up with Minimum Activation Time (MIT)

DP is not running
2 Bid Groups to reflect start-ups:

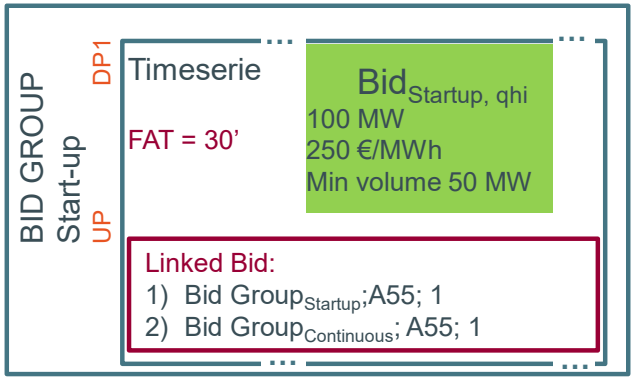
- **Start-up** bids
  - initially available
  - Becomes unavailable if $Bid_{Startup,\ qh-1}$ is activated: **A55 link**
  - Becomes unavailable if $Bid_{Continous,\ qh-1}$ is activated: **A55 link**

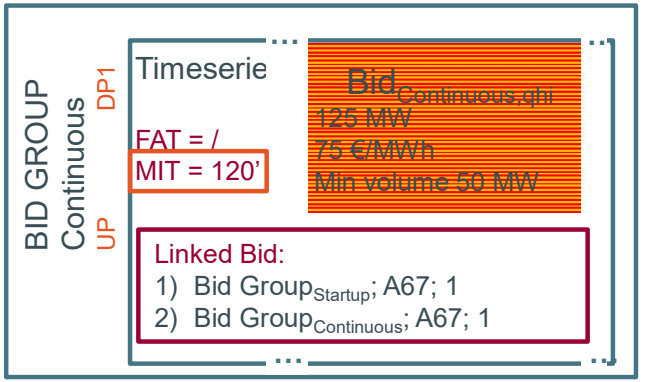
- **Continuous** bid
  - is initially unavailable
  - **Has a MIT**
  - Becomes available if $Bid_{Startup,\ qh-1}$ is activated: **A67 link**
  - Or Becomes available if $Bid_{Continuous,\ qh-1}$ is activated: **A67 link**



Legend:

Bid **available** for selection and activation	Bid **selected / activated**	Bid **unavailable** for selection and activation

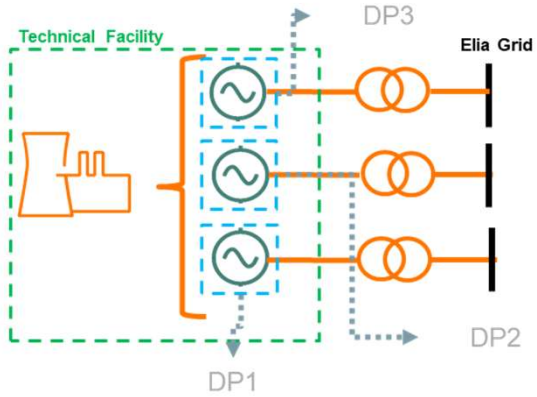


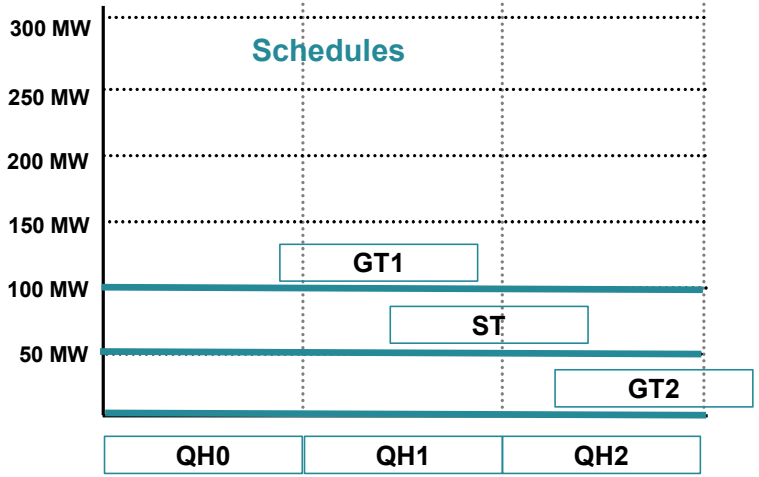


Example of complex biddings

EXAMPLE OF COMPLEX BIDDING

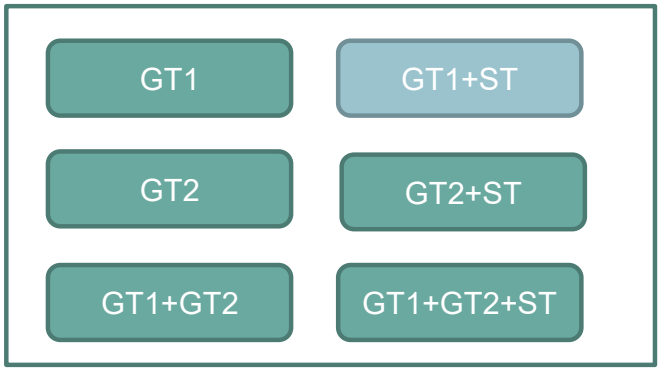
*Combination of Conditional links & Exclusive Groups to reflect Operating modes**





Hypothesis:

- A CCGT with 3 DPs: GT1, GT2 & ST
- This CCGT can technically be operated in multiple Operating modes:



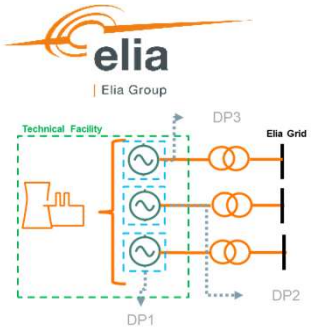
- Current operating mode is (GT1+ST)
- By using the combination of Conditional links and Exclusive Groups, the flexibility of the running operating mode and the all other operating mode can be submitted.

	Pmax	Pmin	Schedule
GT1	150 MW	30 MW	100 MW
GT2	150 MW	30 MW	0 MW
ST	100 MW	20 MW	50 MW

*Only for RD Energy Bids

EXAMPLE OF COMPLEX BIDDING

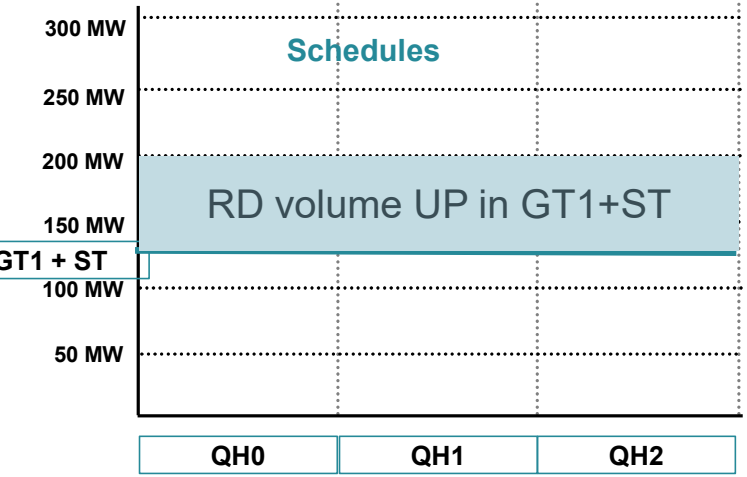
Combination of Conditional links & Exclusive Groups to reflect Operating modes



Current operating mode:

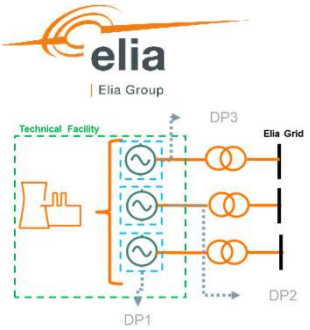
GT1+ST

	Pmax	Pmin	Schedule
GT1	150 MW	30 MW	100 MW
GT2	150 MW	30 MW	0 MW
ST	100 MW	20 MW	20 MW



EXAMPLE OF COMPLEX BIDDING

Combination of Conditional links & Exclusive Groups to reflect Operating modes



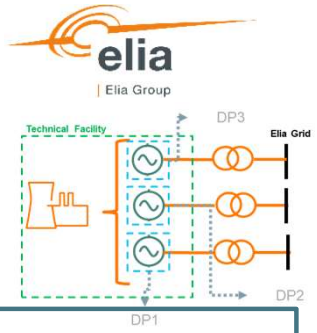
Current operating mode:

GT1+ST

Bid Group		Status			
Bid Group Id	GT1_ST_continous	**Active**			
TimeSeries Id	GT1_ST_continous-UP-				
Direction	UP				
Contracted/Non Contracted					
Parent Child Id					
Exclusive Group Ids	GT1		**00:00**	**00:15**	**00:30**
Linked Bid Group Id		**Volume**	80	80	80
Linked Bid Status		**Price**	150	150	150
Linked Bid Level		**Minimum Volume**			
Full Activation Time		**Activation Type**			
Maximum Activation Time		**Reason**			
Delivery Points	EAN	GT1	TRUE	TRUE	TRUE
	EAN	GT2	TRUE	TRUE	TRUE

EXAMPLE OF COMPLEX BIDDING

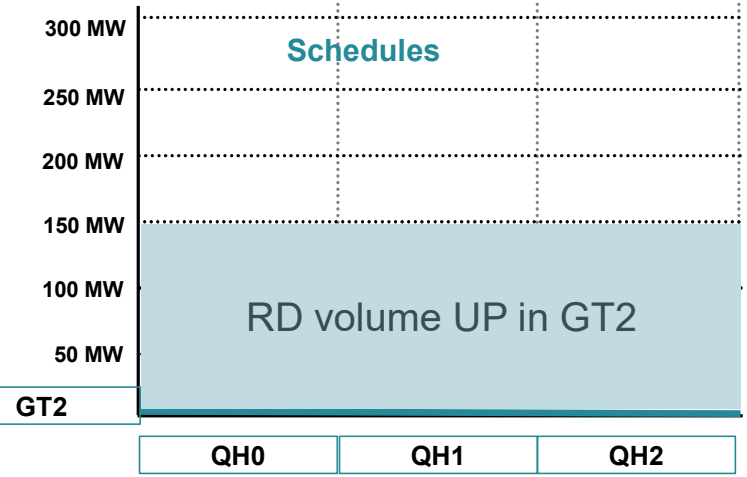
Combination of Conditional links & Exclusive Groups to reflect Operating modes

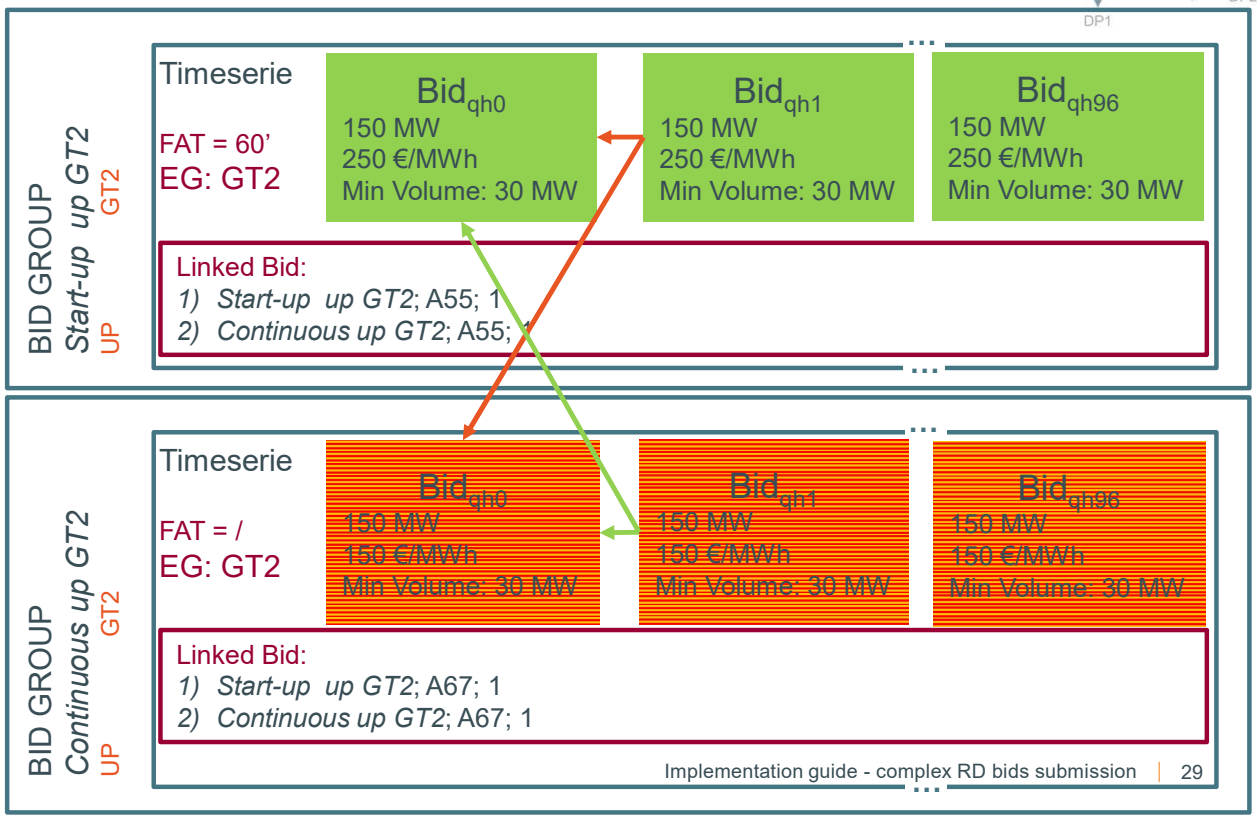


Start-up of other operating mode:

GT2

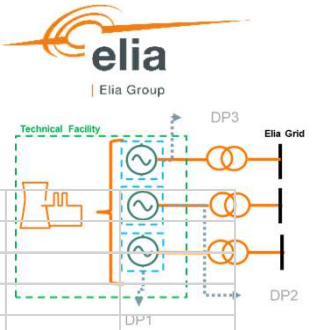
	Pmax	Pmin	Schedule
GT1	150 MW	30 MW	100 MW
GT2	150 MW	30 MW	0 MW
ST	100 MW	20 MW	20 MW





EXAMPLE OF COMPLEX BIDDING

Combination of Conditional links & Exclusive Groups to reflect Operating modes



Start-up of other operating mode:

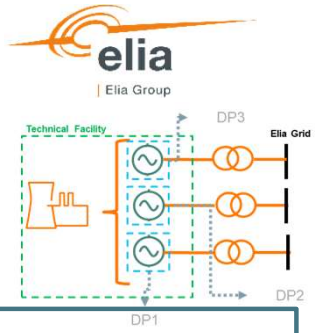
GT2

Bid Group		Status				
Bid Group Id	GT2_startup	Active				
TimeSeries Id	GT2_startup-UP-					
Direction	UP					
Contracted/Non Contracted						
Parent Child Id						
Exclusive Group Ids	GT2		00:00	00:15	00:30	00:45
Linked Bid Group Id	GT2_startup;GT2_continous	Volume	150	150	150	150
Linked Bid Status	A55;A55	Price	250	250	250	250
Linked Bid Level	1;1	Minimum Volume	30	30	30	30
Full Activation Time	30	Activation Type				
Maximum Activation Time		Reason				
Delivery Points	EAN	GT2	TRUE	TRUE	TRUE	TRUE

Bid Group		Status				
Bid Group Id	GT2_continous	Active				
TimeSeries Id	GT2_continous-UP-					
Direction	UP					
Contracted/Non Contracted						
Parent Child Id						
Exclusive Group Ids	GT2		00:00	00:15	00:30	00:45
Linked Bid Group Id	GT2_startup;GT2_continous	Volume	150	150	150	150
Linked Bid Status	A67;A67	Price	150	150	150	150
Linked Bid Level	1;1	Minimum Volume	30	30	30	30
Full Activation Time		Activation Type				
Maximum Activation Time		Reason				
Delivery Points	EAN	GT2	TRUE	TRUE	TRUE	TRUE

EXAMPLE OF COMPLEX BIDDING

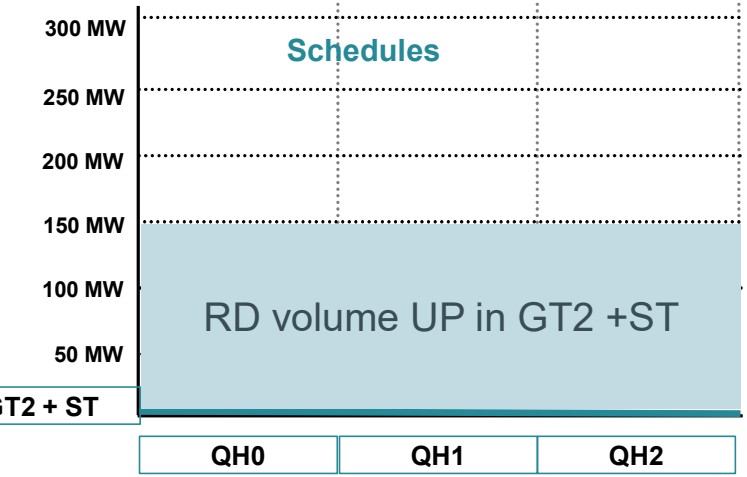
Combination of Conditional links & Exclusive Groups to reflect Operating modes

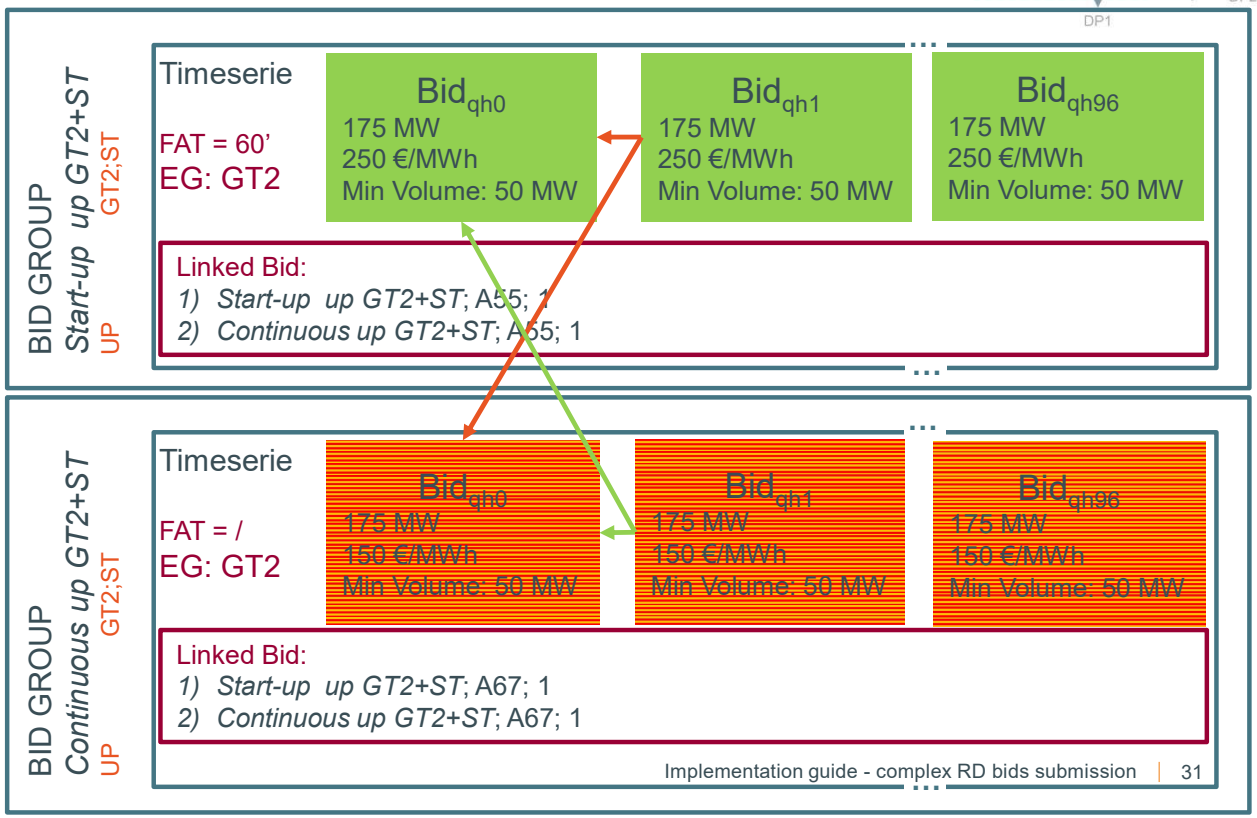


Start-up of other operating mode:

GT2 + ST

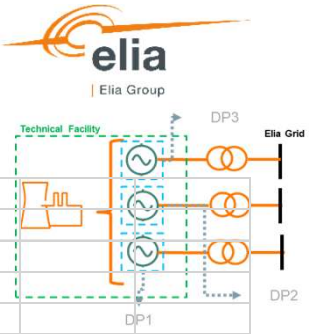
	Pmax	Pmin	Schedule
GT1	150 MW	30 MW	100 MW
GT2	150 MW	30 MW	0 MW
ST	100 MW	20 MW	20 MW





EXAMPLE OF COMPLEX BIDDING

Combination of Conditional links & Exclusive Groups to reflect Operating modes



Start-up of other operating mode:

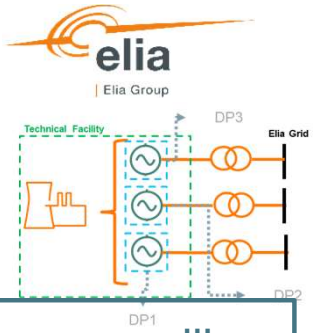
GT2 + ST

Bid Group		Status				
Bid Group Id	GT2_ST_startup	Active				
TimeSeries Id	GT2_ST_startup-UP-					
Direction	UP					
Contracted/Non Contracted						
Parent Child Id						
Exclusive Group Ids	GT2		00:00	00:15	00:30	00:45
Linked Bid Group Id	GT2_ST_startup;GT2_ST_continous	Volume	175	175	175	175
Linked Bid Status	A55;A55	Price	250	250	250	250
Linked Bid Level	1;1	Minimum Volume	50	50	50	50
Full Activation Time	60	Activation Type				
Maximum Activation Time		Reason				
Delivery Points	EAN	GT2	TRUE	TRUE	TRUE	TRUE
	EAN	ST	TRUE	TRUE	TRUE	TRUE

Bid Group		Status				
Bid Group Id	GT2_ST_continous	Active				
TimeSeries Id	GT2_ST_continous-UP-					
Direction	UP					
Contracted/Non Contracted						
Parent Child Id						
Exclusive Group Ids	GT2		00:00	00:15	00:30	00:45
Linked Bid Group Id	GT2_ST_startup;GT2_ST_continous	Volume	175	175	175	175
Linked Bid Status	A67;A67	Price	150	150	150	150
Linked Bid Level	1;1	Minimum Volume	50	50	50	50
Full Activation Time		Activation Type				
Maximum Activation Time		Reason				
Delivery Points	EAN	GT2	TRUE	TRUE	TRUE	TRUE
	EAN	ST	TRUE	TRUE	TRUE	TRUE

EXAMPLE OF COMPLEX BIDDING

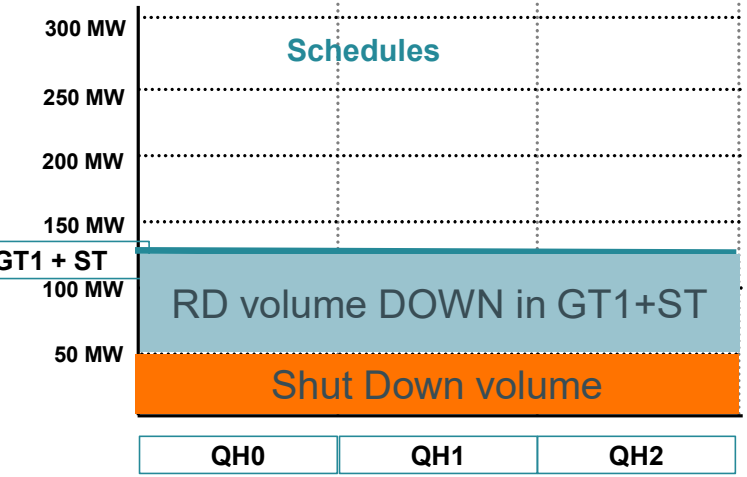
Combination of Conditional links & Exclusive Groups to reflect Operating modes

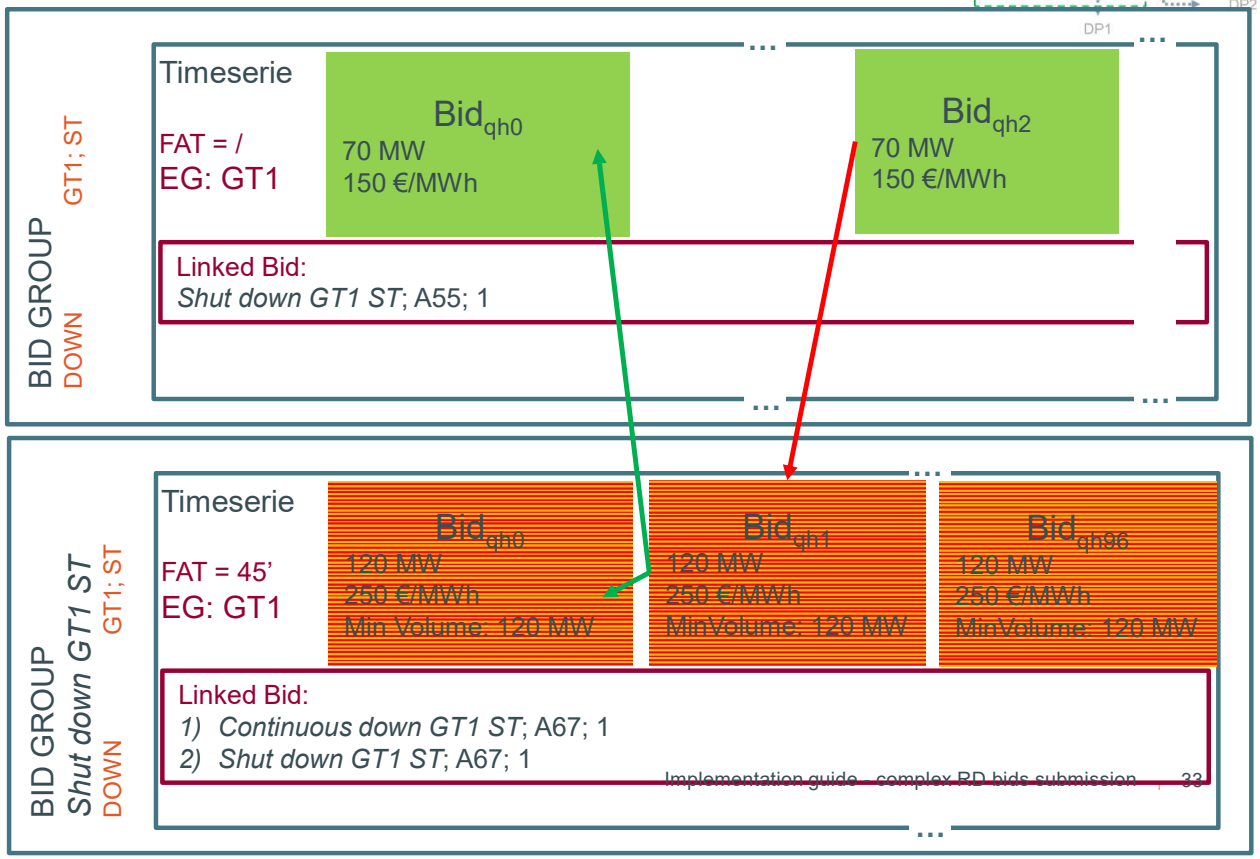


Current operating mode: ➔ special case of shut down

GT1+ST

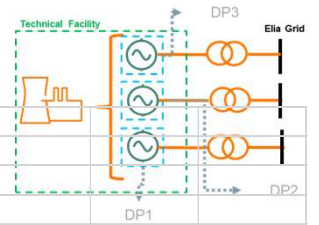
	Pmax	Pmin	Schedule
GT1	150 MW	30 MW	100 MW
GT2	150 MW	30 MW	0 MW
ST	100 MW	20 MW	20 MW





EXAMPLE OF COMPLEX BIDDING

Combination of Conditional links & Exclusive Groups to reflect Operating modes



Current operating mode: ➔ special case of shut down

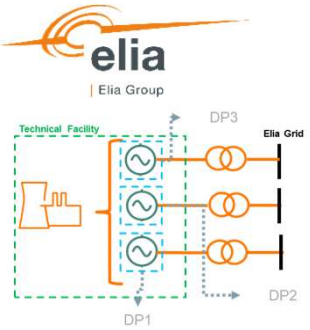
GT1+ST

Bid Group		Status				
Bid Group Id	GT1_ST_continous_down	Active				
TimeSeries Id	GT1_ST_continous_down-DOWN-					
Direction	DOWN					
Contracted/Non Contracted						
Parent Child Id						
Exclusive Group Ids	GT1		**00:00**	**00:15**	**00:30**	**00:45**
Linked Bid Group Id	GT1_ST_shut_down	**Volume**	70	70	70	70
Linked Bid Status	A55	**Price**	150	150	150	150
Linked Bid Level	1	**Minimum Volume**				
Full Activation Time		**Activation Type**				
Maximum Activation Time		**Reason**				
Delivery Points	EAN	GT1	TRUE	TRUE	TRUE	TRUE
	EAN	ST	TRUE	TRUE	TRUE	TRUE

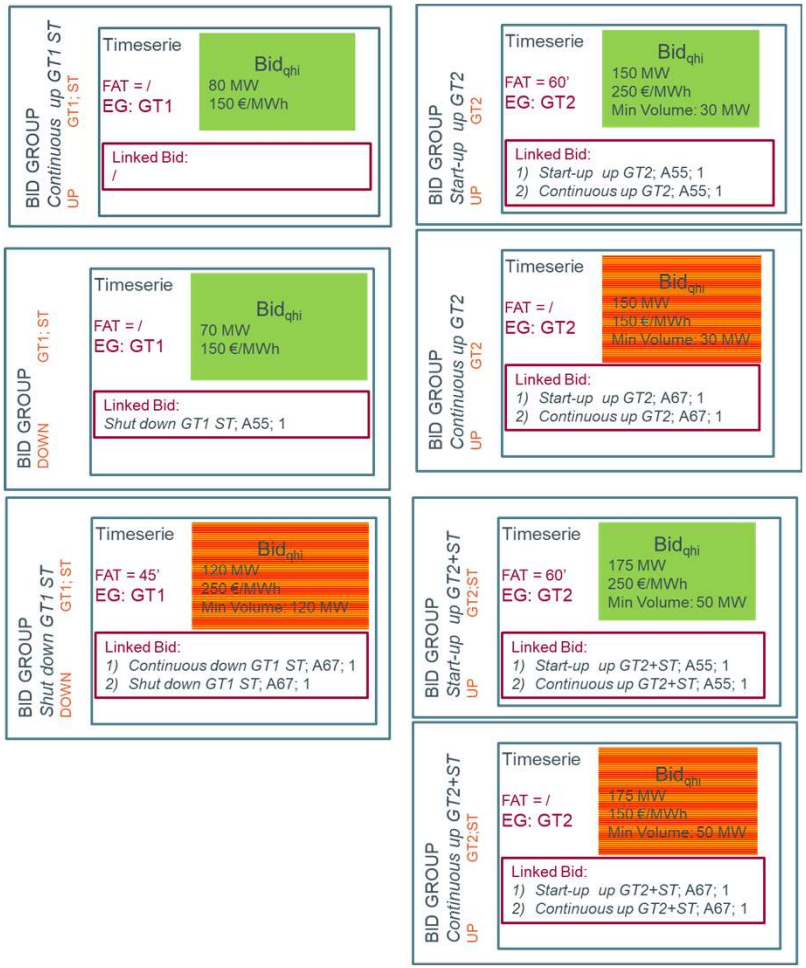
Bid Group		Status				
Bid Group Id	GT1_ST_shut_down	Active				
TimeSeries Id	GT1_ST_shut_down-DOWN-					
Direction	DOWN					
Contracted/Non Contracted						
Parent Child Id						
Exclusive Group Ids	GT1		**00:00**	**00:15**	**00:30**	**00:45**
Linked Bid Group Id	GT1_ST_continous_down;GT1_ST_shut_down	**Volume**	120	120	120	120
Linked Bid Status	A67;A67	**Price**	250	250	250	250
Linked Bid Level	1;1	**Minimum Volume**	120	120	120	120
Full Activation Time	60	**Activation Type**				
Maximum Activation Time		**Reason**				
Delivery Points	EAN	GT1	TRUE	TRUE	TRUE	TRUE
	EAN	ST	TRUE	TRUE	TRUE	TRUE

EXAMPLE OF COMPLEX BIDDING

Combination of Conditional links & Exclusive Groups to reflect Operating modes

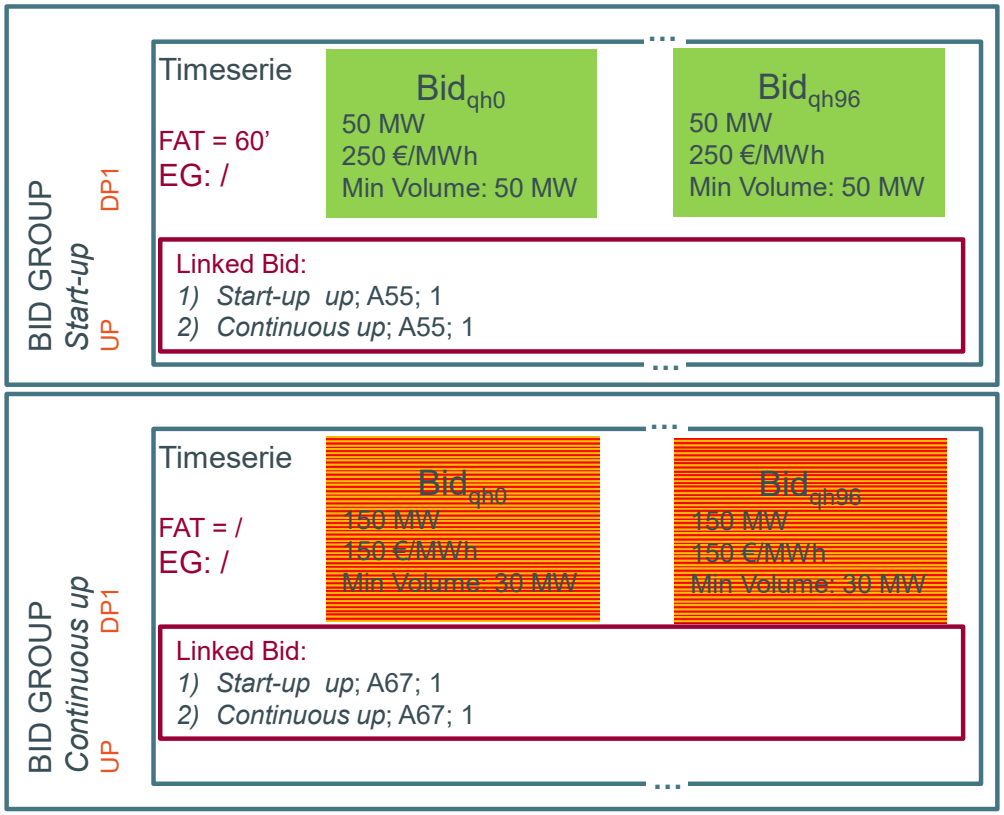


Summary



EXAMPLE OF START-UP

Combination of Conditional links & FAT to reflect slow start-ups

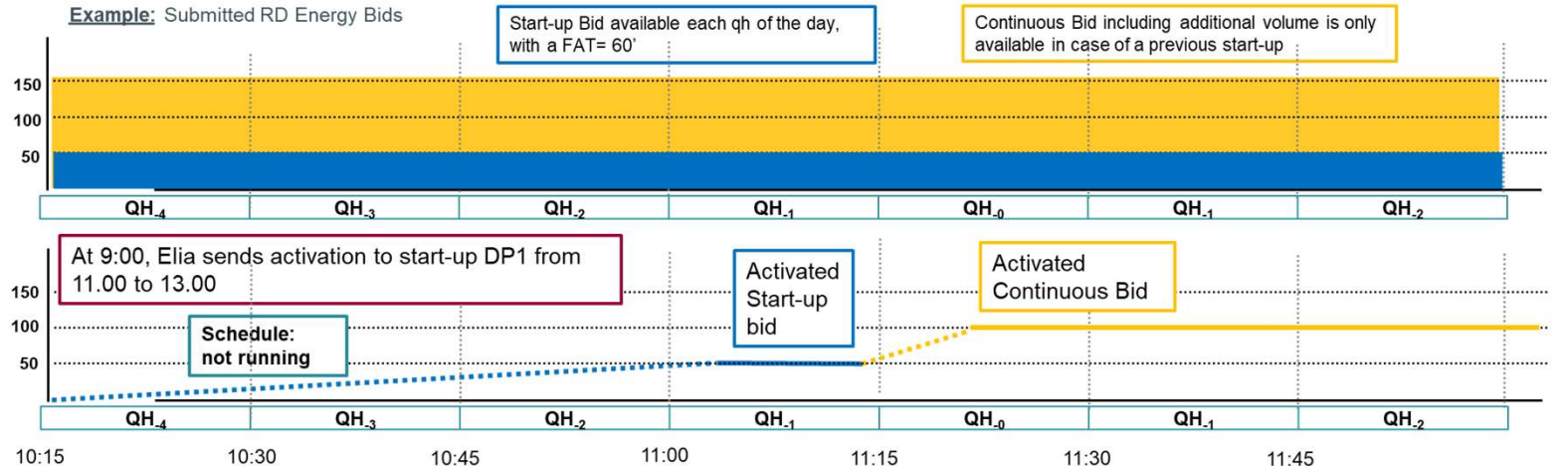


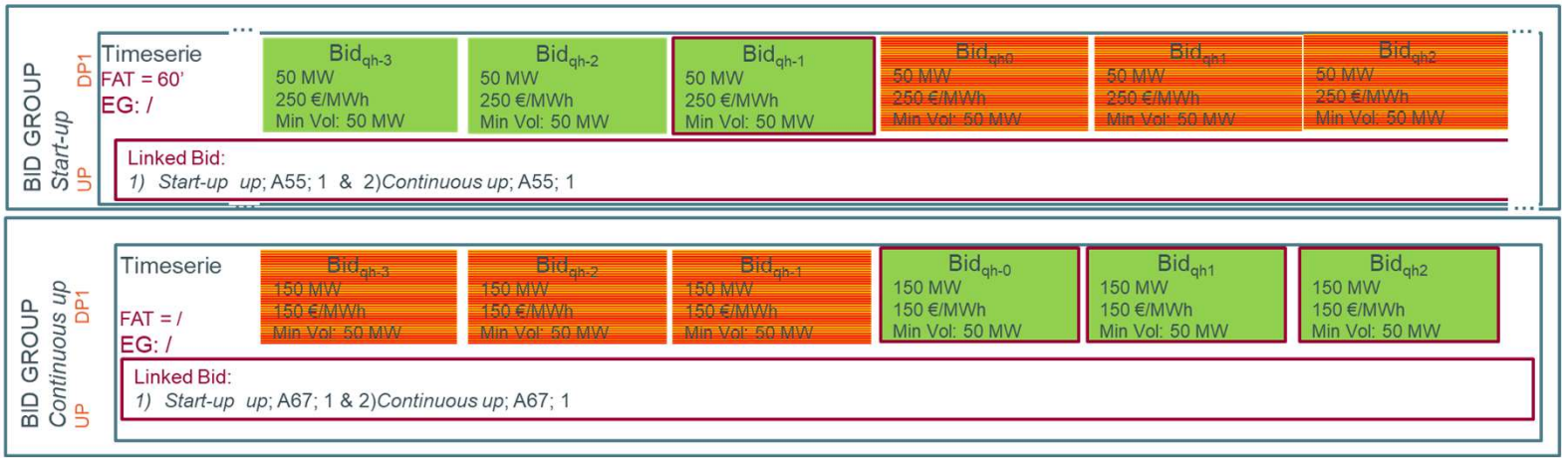
Hypothesis:

- 1 DP not running for the full day
- 2 Bid groups submitted
  - **Start-up** bids
    - initially available
    - Becomes unavailable if $Bid_{Startup,\ qh-1}$ or if $Bid_{Continuous,\ qh-1}$ is activated: **A55 link**
    - Includes a **FAT reflecting the ramp-up** of the start-up until Pmin (50 MW). FAT = 60'
  - **Continuous** bid
    - is initially unavailable
    - Becomes available if $Bid_{Startup,\ qh-1}$ or if $Bid_{Continuous,\ qh-1}$ **A55 link**
    - **FAT = 12,5'**

EXAMPLE OF START-UP

Combination of Conditional links & FAT to reflect slow start-ups





Activation:

- At 9.00, Elia sends activation to start-up DP1 from 11:00 to 13:00
- Activated bids:
  - Start-up bid of qh_{-1} (11:00 to 11:15)
  - Continuous bids from qh_0 to qh_7 (11:15 to 13:00)
- DP1 must reached 50 MW in qh_{-1} and 100 MW in qh_0

COMPLEMENTARY INFORMATION

- Link to the Manual on Energy Bidding
- Bilateral implementation or testing session can be organized.

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Thank you.