



Network Code Capacity Allocation Mechanisms

Recap on NC proposed Auction principles

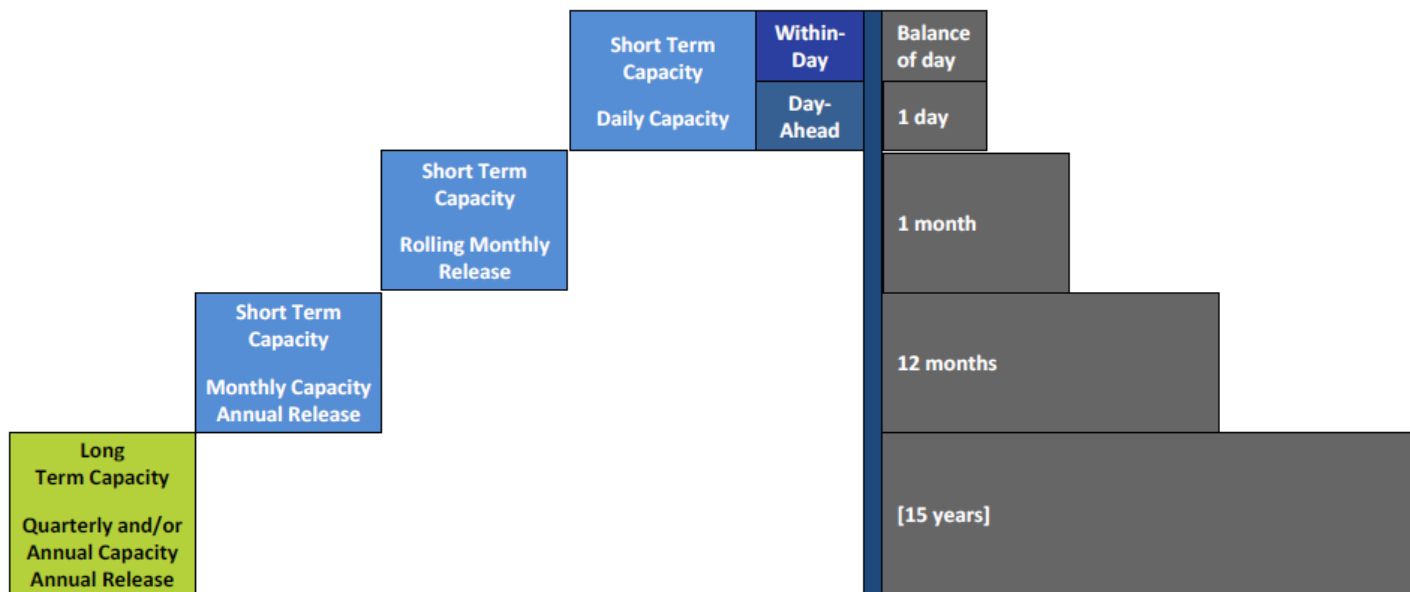
Brussels – 20th July 2011



Allocation methodology

Harmonized auction design = the same all over Europe

- Same auction design shall apply – auctions shall be held simultaneously for all bundled products on concerned IPs



- 10% of available capacity to be reserved for Short Term auctions

Allocation methodology

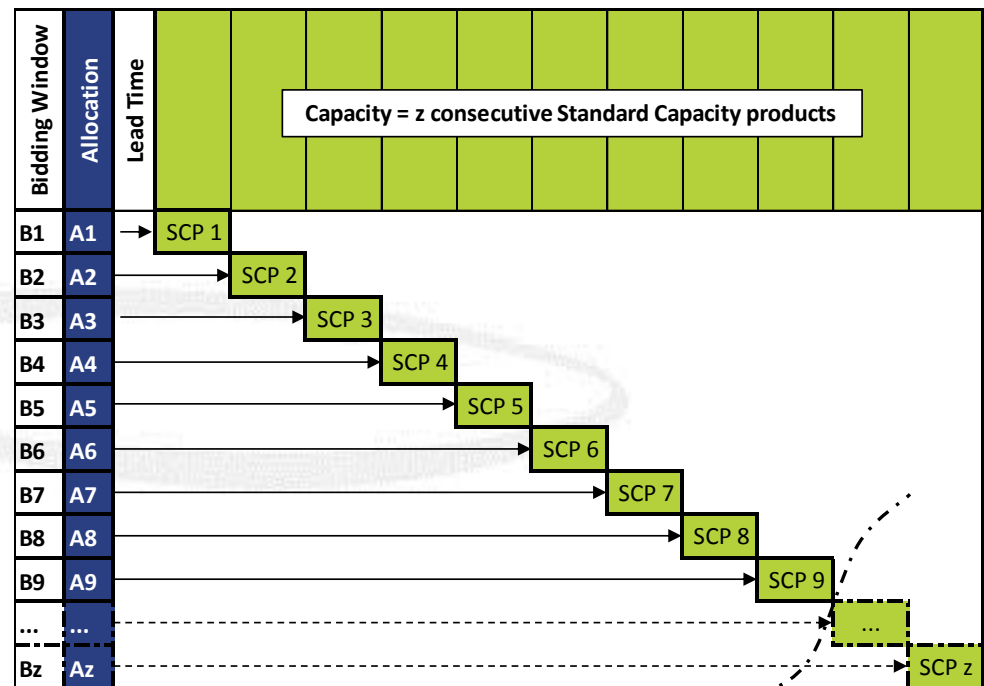
Standard Capacity Products = small set of fixed durations & start

	Type of Auction		Possible Maximum "Service Duration"	Standard Capacity Product	Share of total calculated capacity
Long Term	Alt 1	Annual Quarterly Auctions	From 1 Quarter up to [60] consecutive Quarters	Quarterly	Maximum 90% of calculated available long-term firm capacity
	Alt 2	Annual Yearly Auctions	From 1 Year up to [15] consecutive Years	Yearly	Maximum 90% of calculated available long-term firm capacity
	Alt 3	Annual Quarterly & Yearly Auctions	From 1 Quarter up to [15] consecutive Years	Quarterly + Yearly	Maximum 90% of calculated available long-term firm capacity
Short Term	Annual Monthly Auctions		From 1 Month up to 12 consecutive Months	Monthly	Total calculated available short term firm ¹³ capacity minus allocated quantities from previous firm auctions
	Rolling Monthly (Month-Ahead) Auctions		One month	Monthly	Total calculated available short term firm capacity minus allocated quantities from previous firm auctions plus any surrendered capacity
	Rolling Daily Day-Ahead Auctions		One day	Daily	Total calculated available short term capacity minus allocated quantities from previous firm auctions
	Within-day ¹⁴		Remainder of the day	Daily (or balance of day)	Any remaining available capacity

Allocation methodology

Combining products = Independent auctions envisaged

- All IPs auctioned at the same moment
- Up to 60 quarters auctioned
- No link between
 - Subsequent products
 - Related IPs
- To secure capacity over routes/ longer time, NC allows adjustment of bids
 - information will be published each day



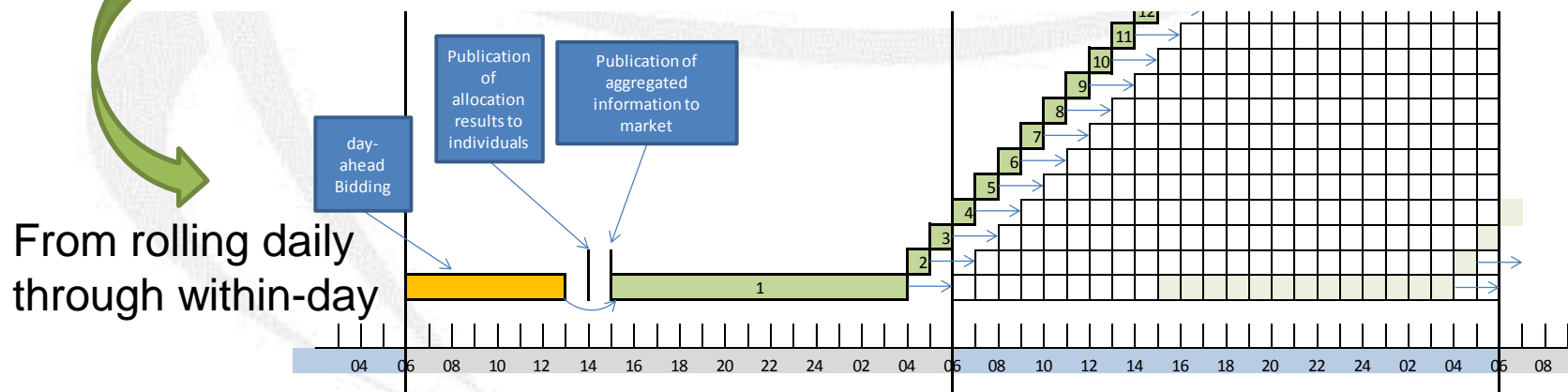
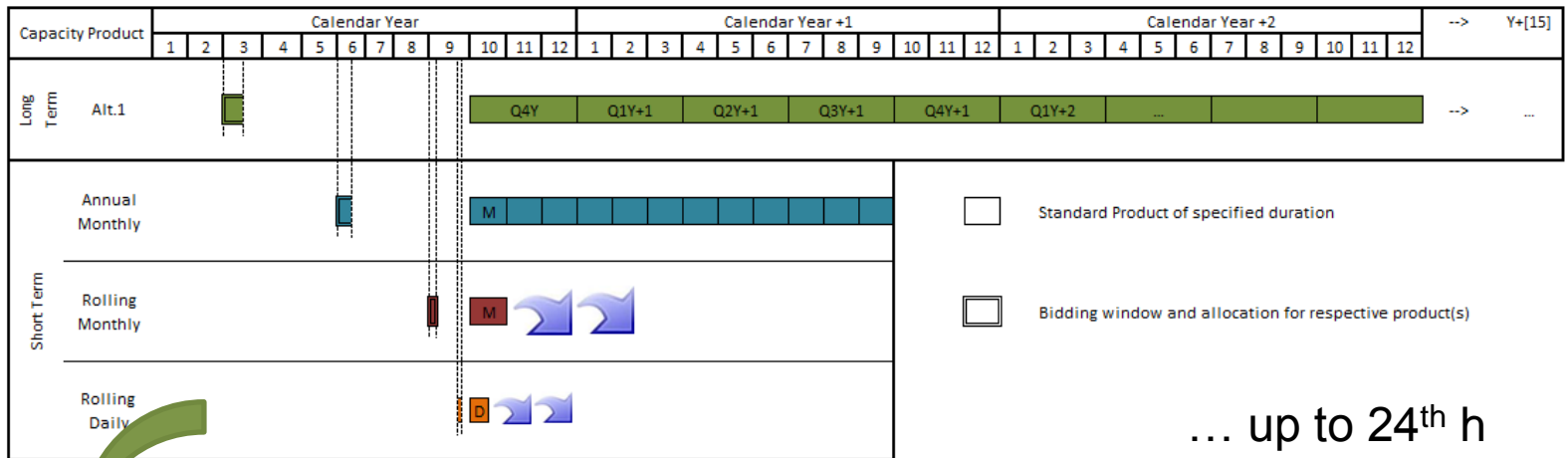
SCP = Standard Capacity Product

B = Bidding Window for the individual bid

A = Allocation of each Standard Capacity Product

Allocation methodology

EU-wide Auction Calendar



Auction Algorithms

Cleared-price, single round methodology

- Volume-based cleared-price algorithm proposed for long term, annual monthly and rolling monthly:
 - compatible with incremental and has practical advantages
 - Price steps will need to be set carefully to minimise unsold capacity and need for pro rating
- Uniform-price algorithm for day-ahead and within-day:
 - Included as workable approach for short term

Auction Algorithms

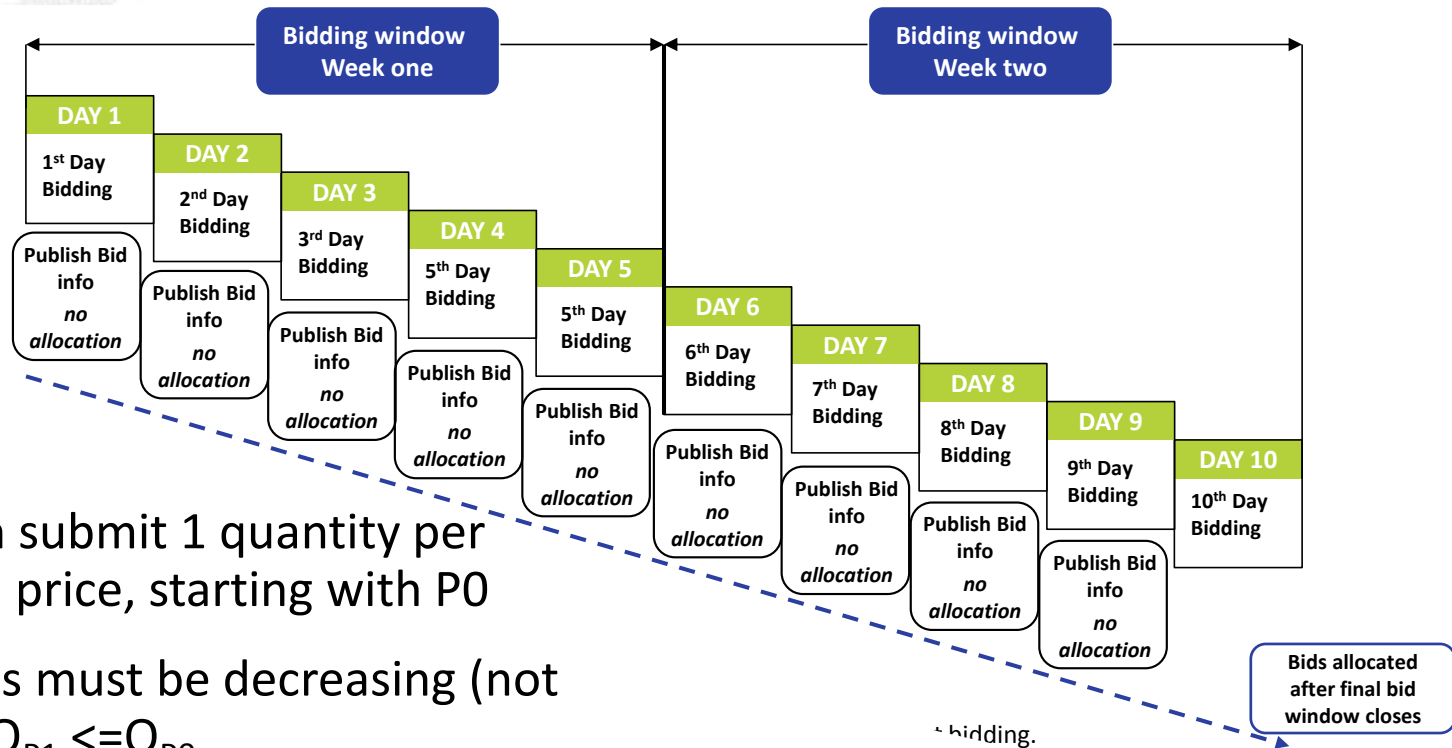
Volume-Based Cleared-Price auction algorithm

- Long Term,
- Annual monthly
- Rolling monthly



Auction Algorithms

Volume-Based Cleared-Price auction algorithm



Users can submit 1 quantity per proposed price, starting with P_0

Quantities must be decreasing (not strictly): $Q_{P_1} \leq Q_{P_0}$

Bids can be submitted from Day 1, but without obligation

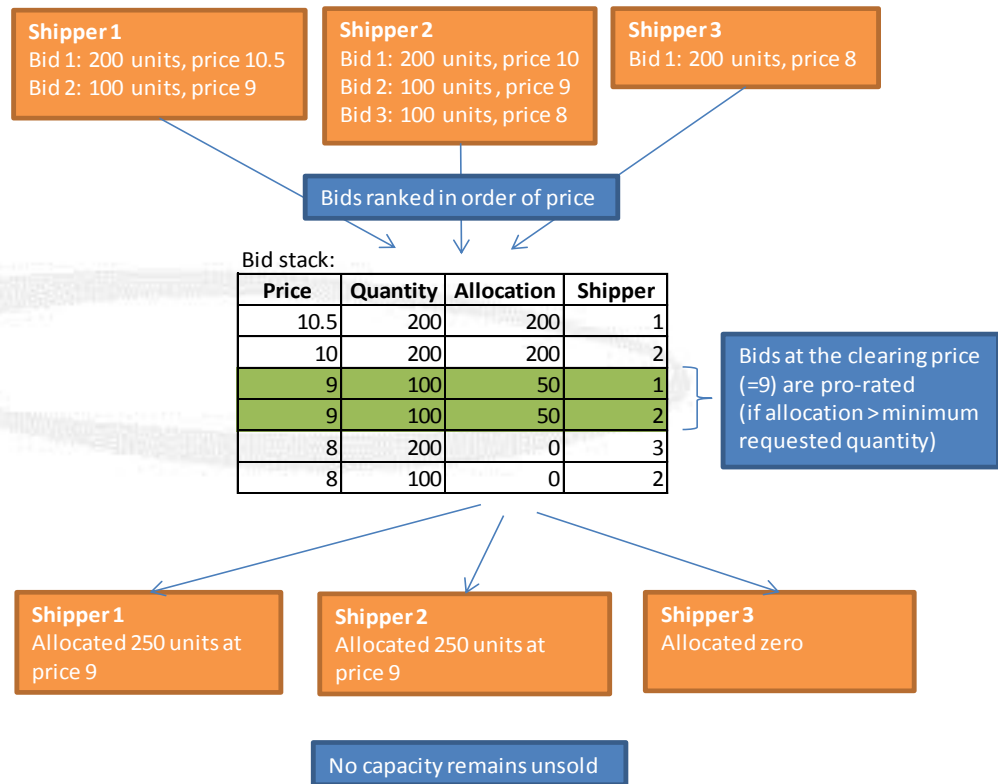
Auction Algorithms

Uniform-Price auction algorithm

- Day-ahead and
- Within-day

Users can submit up to 10 independent bids. The price may be chosen freely and there are no pre-specified price steps. Bids are additive.

Day-ahead auction: 500 units available



Thank you!

ENTSOG





Network Code Capacity Allocation Mechanisms

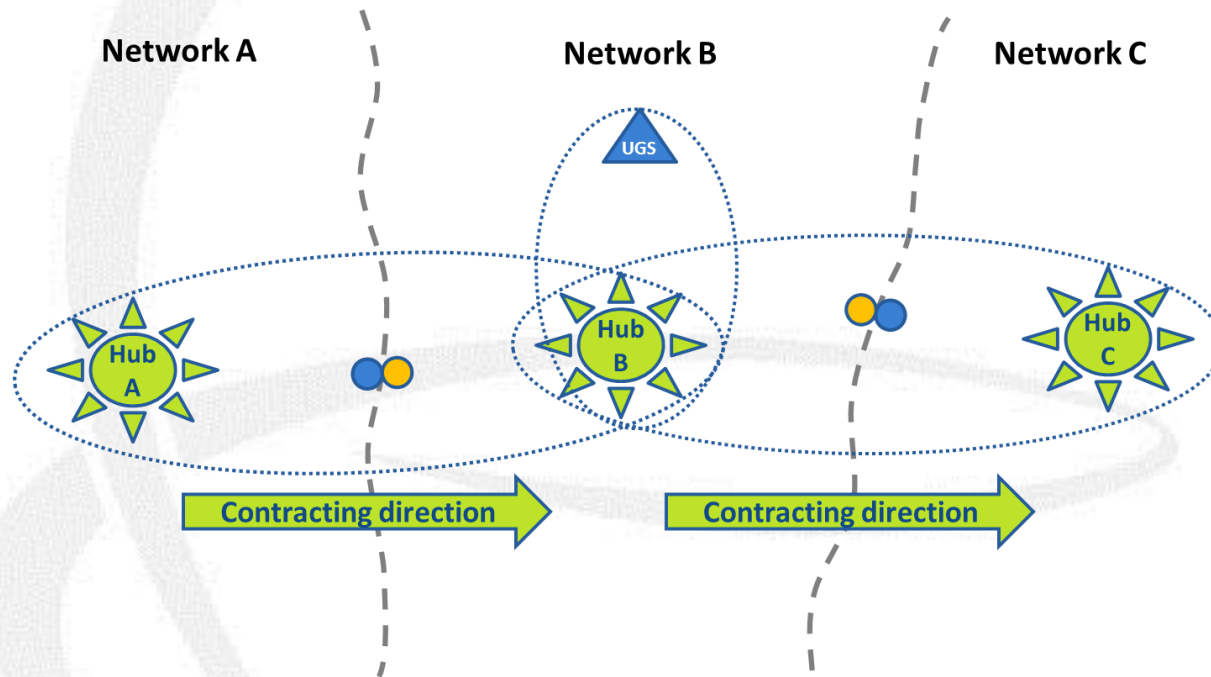
Explanation of auction game

Brussels – 20th July 2011



Introduction

Auction game assumptions



- Three entry-exit systems, two unidirectional IPs
- Firm bundled capacity sold at $A \rightarrow B$ and $B \rightarrow C$

Introduction

Auction game assumptions

In real life	For today's game
Around 150 IPs	Two unidirectional IPs
60 consecutive quarterly products auctioned	Four consecutive quarterly products auctioned
10 day bidding window	Three 'day' bidding window
30 price steps	10 price steps
Bidders can specify minimum quantity	Minimum quantity assumed to be zero
Many shippers	Eight shippers, each with a different business scenario

Introduction

Auction game assumptions

- No capacity has been sold already at these IPs
- Reserve price (=regulated tariff) and price steps are pre-set
- For now we focus just on the mechanism for this one auction
 - ignore the secondary market and later auctions
 - in real life these will play a very important role

Introduction

Business scenarios

- Each team will be given an envelope
- In the envelope is a business scenario
- Your scenario will determine:
 - How much capacity you will need to try and buy
 - Where you need to buy it ($A \rightarrow B$, $B \rightarrow C$, or both?)
 - When you need to buy it (which quarters?); and
 - How much you are allowed to spend

Your job is to meet the aims of the business scenario and to keep within your budget constraints!

The game

Bidding rules

- You can't bid for more than the total capacity available (indicated on each sheet)
- Your bid at each price step must be equal to or lower than your bid at the next lowest price step
- If you don't want to bid, please enter 0

The game

The Excel spreadsheet

Shipper 1				Shipper 2				Business scenario																																																																																				
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Capacity bids				Capacity bids																																																																																								
Quarter 1	P ₉	4.19 €		Quarter 1	P ₈	8.90 €		<table border="1"> <thead> <tr> <th>Product</th> <th>Quarter</th> <th>CP</th> <th>Total Demand</th> <th>Price</th> <th>Bid Qty</th> <th>Allocated Qty</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Bundled capacity A-B</td> <td>Quarter 1</td> <td>P1</td> <td>600,000</td> <td>3.31</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity A-B</td> <td>Quarter 2</td> <td>P0</td> <td></td> <td>1.5</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity A-B</td> <td>Quarter 3</td> <td>P0</td> <td></td> <td>2.5</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity A-B</td> <td>Quarter 4</td> <td>P0</td> <td></td> <td>2.9</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity B-C</td> <td>Quarter 1</td> <td>P0</td> <td></td> <td>3.5</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity B-C</td> <td>Quarter 2</td> <td>P0</td> <td></td> <td>1.7</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity B-C</td> <td>Quarter 3</td> <td>P0</td> <td></td> <td>1.5</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td>Bundled capacity B-C</td> <td>Quarter 4</td> <td>P0</td> <td></td> <td>3.2</td> <td>0</td> <td>0 €</td> <td>-</td> </tr> <tr> <td colspan="7"></td> <td>Total €</td> <td>-</td> </tr> </tbody> </table>				Product	Quarter	CP	Total Demand	Price	Bid Qty	Allocated Qty	Cost	Bundled capacity A-B	Quarter 1	P1	600,000	3.31	0	0 €	-	Bundled capacity A-B	Quarter 2	P0		1.5	0	0 €	-	Bundled capacity A-B	Quarter 3	P0		2.5	0	0 €	-	Bundled capacity A-B	Quarter 4	P0		2.9	0	0 €	-	Bundled capacity B-C	Quarter 1	P0		3.5	0	0 €	-	Bundled capacity B-C	Quarter 2	P0		1.7	0	0 €	-	Bundled capacity B-C	Quarter 3	P0		1.5	0	0 €	-	Bundled capacity B-C	Quarter 4	P0		3.2	0	0 €	-								Total €	-
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	P ₆	3.86 €			P ₅	6.50 €																																																																																						
600,000	P ₅	3.75 €			P ₄	5.90 €																																																																																						
	P ₄	3.64 €			P ₃	5.30 €																																																																																						
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Quarter 2	P ₉	2.40 €		Quarter 2	P ₈	2.51 €																																																																																						
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	P ₇	2.20 €			P ₆	2.33 €																																																																																						
	P ₆	2.10 €			P ₅	2.24 €																																																																																						
800,000	P ₅	2.00 €			P ₄	2.15 €																																																																																						
	P ₄	1.90 €			P ₃	2.06 €																																																																																						
	P ₃	1.80 €			P ₂	1.97 €																																																																																						
	P ₂	1.70 €			P ₁	1.88 €																																																																																						
	P ₁	1.60 €			P ₀	1.79 €																																																																																						
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	P ₀	1.50 €			P ₀	1.50 €																																																																																						
Quarter 4	P ₉	4.25 €		Quarter 4	P ₈	4.28 €																																																																																						
Total available capacity	P ₈	4.10 €		Total available capacity	P ₇	4.16 €																																																																																						
	P ₇	3.95 €			P ₆	4.04 €																																																																																						
	P ₆	3.80 €			P ₅	3.92 €																																																																																						
400,000	P ₅	3.65 €			P ₄	3.80 €																																																																																						
	P ₄	3.50 €			P ₃	3.68 €																																																																																						
	P ₃	3.35 €			P ₂	3.56 €																																																																																						
	P ₂	3.20 €			P ₁	3.44 €																																																																																						
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	P ₀	2.90 €			P ₉	4.28 €																																																																																						

Shipper 1			
Capacity bids			
Quarter 1	P ₉	4.19 €	
Total available capacity	P ₈	4.08 €	
	P ₇	3.97 €	
600,000	P ₆	3.86 €	
	P ₅	3.75 €	
	P ₄	3.64 €	
	P ₃	3.53 €	
	P ₂	3.42 €	
	P ₁	3.31 €	
	P ₀	3.20 €	

Example: IP A→B, quarter 1

Day 1 (25 minutes)

Shipper 1
Capacity bids

Quarter 1	P ₉	4.19 €	
Total available capacity	P ₈	4.08 €	
	P ₇	3.97 €	
	P ₆	3.86 €	
600,000	P ₅	3.75 €	
	P ₄	3.64 €	
	P ₃	3.53 €	
	P ₂	3.42 €	
	P ₁	3.31 €	
	P ₀	3.20 €	

Shipper 2
Capacity bids

Quarter 1	P ₉	4.19 €	
Total available capacity	P ₈	4.08 €	
	P ₇	3.97 €	
	P ₆	3.86 €	
600,000	P ₅	3.75 €	
	P ₄	3.64 €	
	P ₃	3.53 €	
	P ₂	3.42 €	
	P ₁	3.31 €	
	P ₀	3.20 €	

Example: IP A→B, quarter 1

Day 1 (25 minutes)

Shipper 1
Capacity bids

Quarter 1	P ₉	4.19 €	100,000
Total available capacity	P ₈	4.08 €	100,000
	P ₇	3.97 €	100,000
	P ₆	3.86 €	100,000
600,000	P ₅	3.75 €	100,000
	P ₄	3.64 €	100,000
	P ₃	3.53 €	100,000
	P ₂	3.42 €	200,000
	P ₁	3.31 €	300,000
	P ₀	3.20 €	400,000

Shipper 2
Capacity bids

Quarter 1	P ₉	4.19 €	300,000
Total available capacity	P ₈	4.08 €	300,000
	P ₇	3.97 €	300,000
	P ₆	3.86 €	300,000
600,000	P ₅	3.75 €	300,000
	P ₄	3.64 €	300,000
	P ₃	3.53 €	300,000
	P ₂	3.42 €	300,000
	P ₁	3.31 €	300,000
	P ₀	3.20 €	300,000

Example: IP A→B, quarter 1

Day 1: interim results

- Clearing price = P1 if the auction closed now

Bundled capacity A-B

Quarter 1			Total
P ₉	4.19 €	400,000	400,000
P ₈	4.08 €	400,000	400,000
P ₇	3.97 €	400,000	400,000
P ₆	3.86 €	400,000	400,000
P ₅	3.75 €	400,000	400,000
P ₄	3.64 €	400,000	400,000
P ₃	3.53 €	400,000	400,000
P ₂	3.42 €	500,000	500,000
P ₁	3.31 €	600,000	600,000
P ₀	3.20 €	700,000	700,000
Total available capacity			600,000

Example: IP A→B, quarter 1

Day 2 (10 minutes): interim results

- Clearing price = P₉ if the auction closed now
 - pro rata allocation would be needed

Bundled capacity A-B

Quarter 1	Total
P ₉ 4.19 €	800,000
P ₈ 4.08 €	800,000
P ₇ 3.97 €	800,000
P ₆ 3.86 €	800,000
P ₅ 3.75 €	800,000
P ₄ 3.64 €	800,000
P ₃ 3.53 €	800,000
P ₂ 3.42 €	800,000
P ₁ 3.31 €	800,000
P ₀ 3.20 €	800,000
Total available capacity	600,000

Example: IP A→B, quarter 1

Day 3 (15 minutes): final results

- Clearing price = P₀

Bundled capacity A-B

Quarter 1		Total
P ₉	4.19 €	0
P ₈	4.08 €	0
P ₇	3.97 €	0
P ₆	3.86 €	0
P ₅	3.75 €	0
P ₄	3.64 €	100,000
P ₃	3.53 €	200,000
P ₂	3.42 €	300,000
P ₁	3.31 €	400,000
P ₀	3.20 €	500,000
Total available capacity		600,000

Example: IP A→B, quarter 1

Individual allocations after day 1

Individual allocation table: shipper 1							
		Input	Input	Taking Pro-rata at P9 into account			
Product	Quarter	CP	Total Demand	Price	Bid Qty	Allocated Qty	Cost
Bundled capacity A-B	Quarter 1	P1	600,000	3.31	300000	300000	€ 993,000
Bundled capacity A-B	Quarter 2	P0		1.5	0	0	€ -
Bundled capacity A-B	Quarter 3	P0		1.5	0	0	€ -
Bundled capacity A-B	Quarter 4	P0		2.9	0	0	€ -
Bundled capacity B-C	Quarter 1	P0		3.5	0	0	€ -
Bundled capacity B-C	Quarter 2	P0		1.7	0	0	€ -
Bundled capacity B-C	Quarter 3	P0		1.5	0	0	€ -
Bundled capacity B-C	Quarter 4	P0		3.2	0	0	€ -
						Total	€ 993,000

The game

To help the game run smoothly...

- Remember:
 - A bid at one price step must be lower than or equal to the bid at the next lowest price step
 - You can't bid for more than the total capacity available
- Please stick to the time limit
- Save your bids on to a USB stick at the end of each round and bring them up to the front

Each team has an ENTSOG facilitator to help explain the game and to answer any questions about auctions that you may have
- Please use them!

The game

Team feedback

- Please pick a spokesperson for your team who will talk about your experiences after lunch
- Please write your thoughts on the paper provided:
 - What was your bidding strategy?
 - Did your team achieve its aims?
 - What went well for you and what didn't go so well, and why?
 - Which parts of the auction design worked well?
 - Which parts of the auction design would you change, and how?

We want your views!



Thank you
We hope you enjoy the game!

ENTSOG