

The Nordic regulating power market

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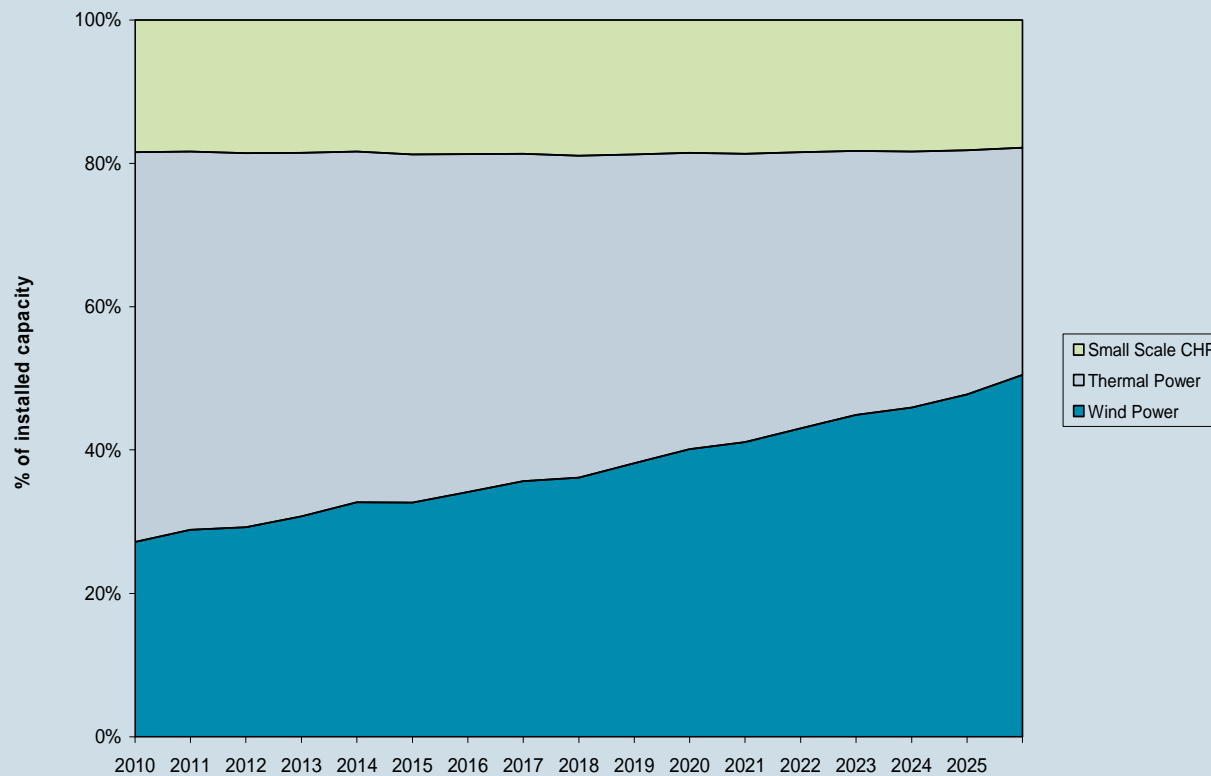
Brussels, 10 June 2010



Agenda

- **Expanding the Danish wind power towards 2020**
- **The Nordic regulating power market**

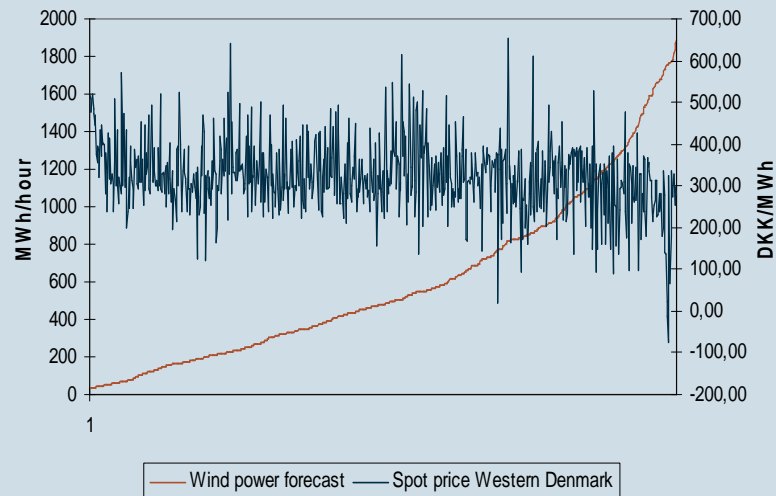
A scenario for the expansion of the wind power capacity in Denmark



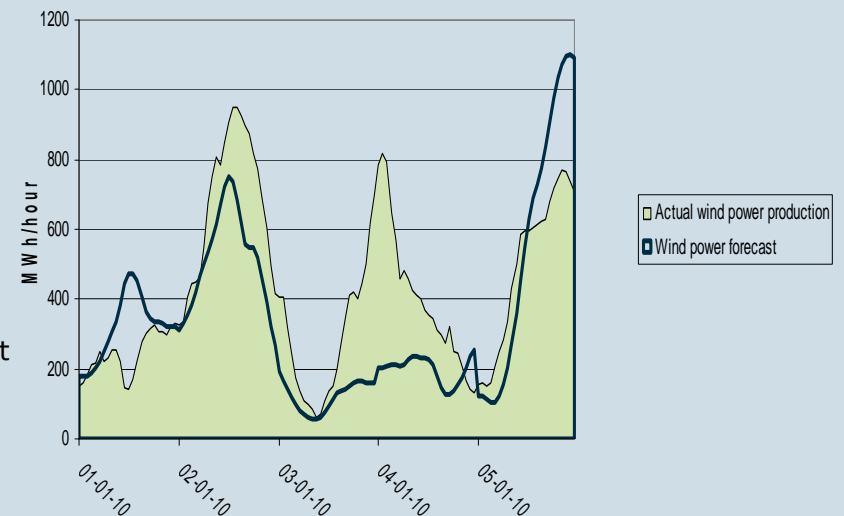
Source: Energinet.dk

Wind power drives spot-prices down

Wind Power forecast and spot prices Western Denmark
January 2010

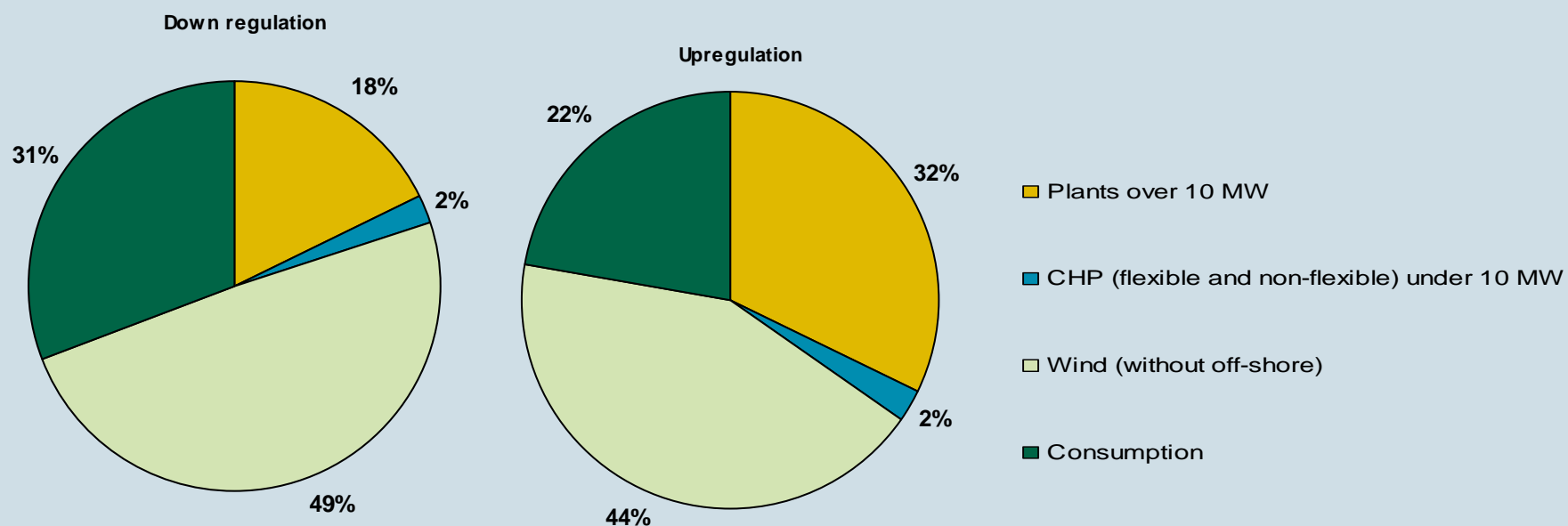


Wind power forecast and actual wind power production
Western Denmark 1-5. January 2010



- Price-peaks are non-existing in hours with high wind power forecasts, but at lower forecast levels price peaks is more frequent
- Wind power will be one of the main future price drivers
- But wind power comes with an extra costs: Forecast errors
- Roughly 25 % of the actual wind production in Western Denmark in the last half of 2009 was handled by the balancing market

System imbalances Western Denmark (2009)



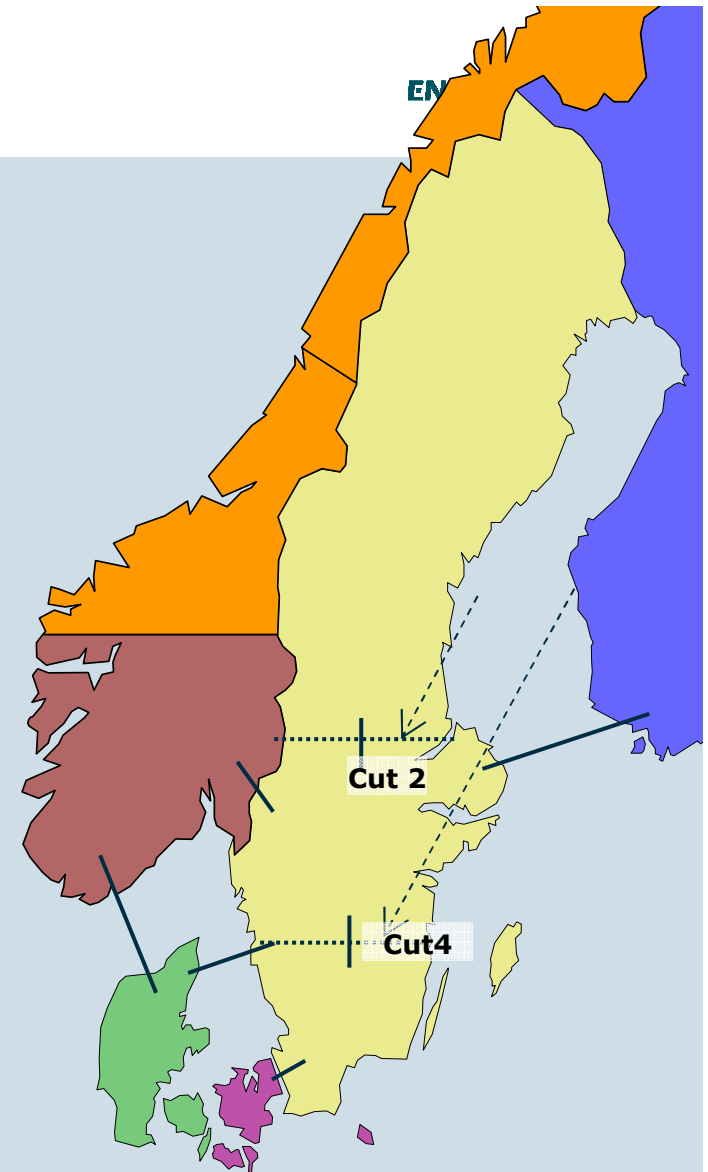
- Wind Power is the largest cause for imbalances in the Danish power system
- Balancing Wind Power requires cross-border balancing and therefore balancing market integration

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The Nordic regulating power market

- **All of the Nordic power system must represent one common Nordic market for regulating power:**
 - Necessary regulations must be made in the subsystem having the lowest regulation costs
 - The regulating power and the balance prices offered to the market players is the same in all areas for much of the year
 - The individual TSOs must no longer regulate according to their own subsystem
 - Svenska Kraftnät and Statnett is overall responsible for the balance in the Nordic synchronous area
 - Eastern Denmark has been a part of the market since 2002
 - Western Denmark was fully integrated into the market in 2008



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Balance : Bids activation/deactivation

Bids activation/deactivation

Grid: last refresh 12:44:43, day 12, juni 2009, hour 12:13

Tick	Ear Mark	Price / DKK	Price / DKK	Amount / MW	Party	ELSPOT area	Internal area	Bid type	Activation time	Balance	Special	Bid unavailable	Power Plant
		300	300	14	Energinet.dk	DK1	DK1	CIAL		15	*****		
		300	300	25	Energinet.dk	DK1	DK1	CIAL		15	*****		
		298	298	12	Svk	SE	SE2	CIAL		10	*****		
		297	297	50	Statnett	NO3	NO3	CIAL		15			
		295	295	25	Energinet.dk	DK1	DK1	CIAL		15	*****		
		295	295	16	Energinet.dk	DK1	DK1	CIAL		15	*****		
		293	293	10	Statnett	NO1	NO1	CIAL		15			
		293	293	50	Statnett	NO1	NO1	CIAL		15			
		291	291	10	Svk	SE	SE2	CIAL		5	*****		
		291	291	12	Svk	SE	SE2	CIAL		10	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		286	286	10	Energinet.dk	DK1	DK1	CIAL		15	*****		
		284	284	-12	Svk	SE	SE2	CIAL		10			
		282	282	-10	Energinet.dk	DK1	DK1	CIAL		15			
		277	277	-100	Svk	SE	SE3	CIAL		10			
		263	263	-70	Svk	SE	SE3	CIAL		10			
		261	261	-10	Fingid	FI	FI1	CIAL		15			
		259	259	25	Statnett	NO1	NO1	CIAL		15	*****		
		256	256	-42	Svk	SE	SE2	CIAL		10			
		255	255	-25	Statnett	NO1	NO1	CIAL		15	*****		
		255	255	40	Statnett	NO1	NO1	CIAL		15			
		255	255	-70	Statnett	NO1	NO1	CIAL		15			
		253	253	-20	Fingid	FI	FI2	CIAL		15			
		251	251	-25	Statnett	NO1	NO1	CIAL		15	*****		
		251	251	-65	Statnett	NO1	NO1	CIAL		15	*****		
		251	251	-15	Statnett	NO2	NO2	CIAL		15			
		250	250	-126	Svk	SE	SE1	CIAL		10			
		249	249	-65	Svk	SE	SE2	CIAL		10			
		249	249	-100	Svk	SE	SE3	CIAL		10			

Up Down

Show Details

MW	Total Bids	Selected Bids	Balance act.	Special act.
Up	11436		424	
Down	-9475		-302	-46

	Balance Margin Price (DKK)						
	NO1	NO2	NO3	SE	DK1	DK2	FI
Up				306,13	306,00		
Down	242,39						

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The Nordic regulating power market

- **The market is divided when congestion occurs:**
 - When congestion occurs between the subsystems, the common market is divided
 - The division is made in advance when congestion occurs in the day-ahead market or in the hour of operation
 - If congestion in the day-ahead market does not result in congestion in the hour of operation, the regulating power price in the two subsystems will remain equal
 - When congestion occurs between two subsystems, each of the systems get an individual regulating power price
- **Further developments of the Nordic regulation power market**
 - Integration of consumption resources
 - Ancillary services from wind turbines
 - Further cooperation with neighbouring countries (Germany)