

Tennet

ONL 15-162

Stakeholder engagement and
Consultation Process OWFs

Day 2



Expert Meeting, 15-16.04.2015, Arnhem

Michiel Müller / Rob van der Hage



Welcome



Agenda (16.04.2016)

WHEN	WHAT	TYPE OF SESSION
09.30-09.40	Welcome Agenda for today	Introduction
09.40-10.30	T.6 Protection [D]	Discussion
10.30-11.20	T.11 Overplanting [D]	Discussion
11.20-12.10	P.1 Planning [D]	Discussion
12.10-12.30	Break & collect lunch	
12.30-14.30	L.1 Connection Agreement, Realisation Agreement and implementation of net code [D]	Discussion - Dedicated Legal Session
14.30-14.45	Closure	
[N]	Notification session	
[D]	Discussion session	
[I]	Information session	



T6_Protection

Discussion



T6_Protection

Input

- Position paper TenneT (ONL 15-080-T6_Protection_PP_v1)

Main considerations

- The PPM's connected to the TenneT offshore platform will be subjected to the applicable requirements set out in the RfG, which applies to, but is not limited to, the following subjects (overall list: not all mentioned topics are applicable to this paper):
 - Fault-ride-through capability
 - Electrical protection schemes and settings
 - Priority ranking (not covered in this paper)
 - Information exchange (not covered in this paper)
- TenneT considered two options for the protection of offshore PPM strings connected to a TenneT offshore platform:
 - Option 1: PPM owned protection system
 - Option 2: TenneT owned protection system



T6_Protection

Position

On the assumption that the additional legal consequences will be acceptable for both TenneT and PPMs, the above considerations lead TenneT to the following position:

- TenneT is inclined towards standardising the protection of the offshore PPM inter-array cable strings to the TenneT offshore transformer platform by implementing a standard protection system, owned, operated and maintained by TenneT for all five platforms to be realised by TenneT up to 2023



Questions & concerns



T11_Overplanting

Discussion



T11_Overplanting

Input

- Position paper TenneT (ONL 15-083-T11_Overplanting_PP_v1)

Main considerations

- Main focus is on the 220 kV export cable from the offshore substation up to and including the beach landing, as this is considered to be the limiting factor in the offshore grid.
- The offshore grid design will be based on the following grid parameters:
 - Grid capacity per PPM at offshore CP: 350MW
 - Number of PPM per offshore platform: 2
 - Reactive power exchange at CP
under normal conditions: Max +/- 0,1 p.u. (+/- 35 Mvar)
 - Nominal voltage level onshore / offshore: 225 / 230kV +/- 1%
- The results of the dynamic load calculations show that for an optimized cable design (at 700MW design capacity), the transmission of 10% additional active power is allowable, but not guaranteed.



T11_Overplanting

Position

- TenneT is inclined towards allowing the PPMs to transmit 10% above their rated power (350MW), which is 35MW extra, with the requirement for PPM's to curtail their produced power, in case the 220 kV export cables reach their maximum allowable temperature limits. Details on curtailment of the PPMs will be addressed to in the 'Customer Connection Agreements (ATO)'.



Questions & concerns



P1_Planning

Discussion

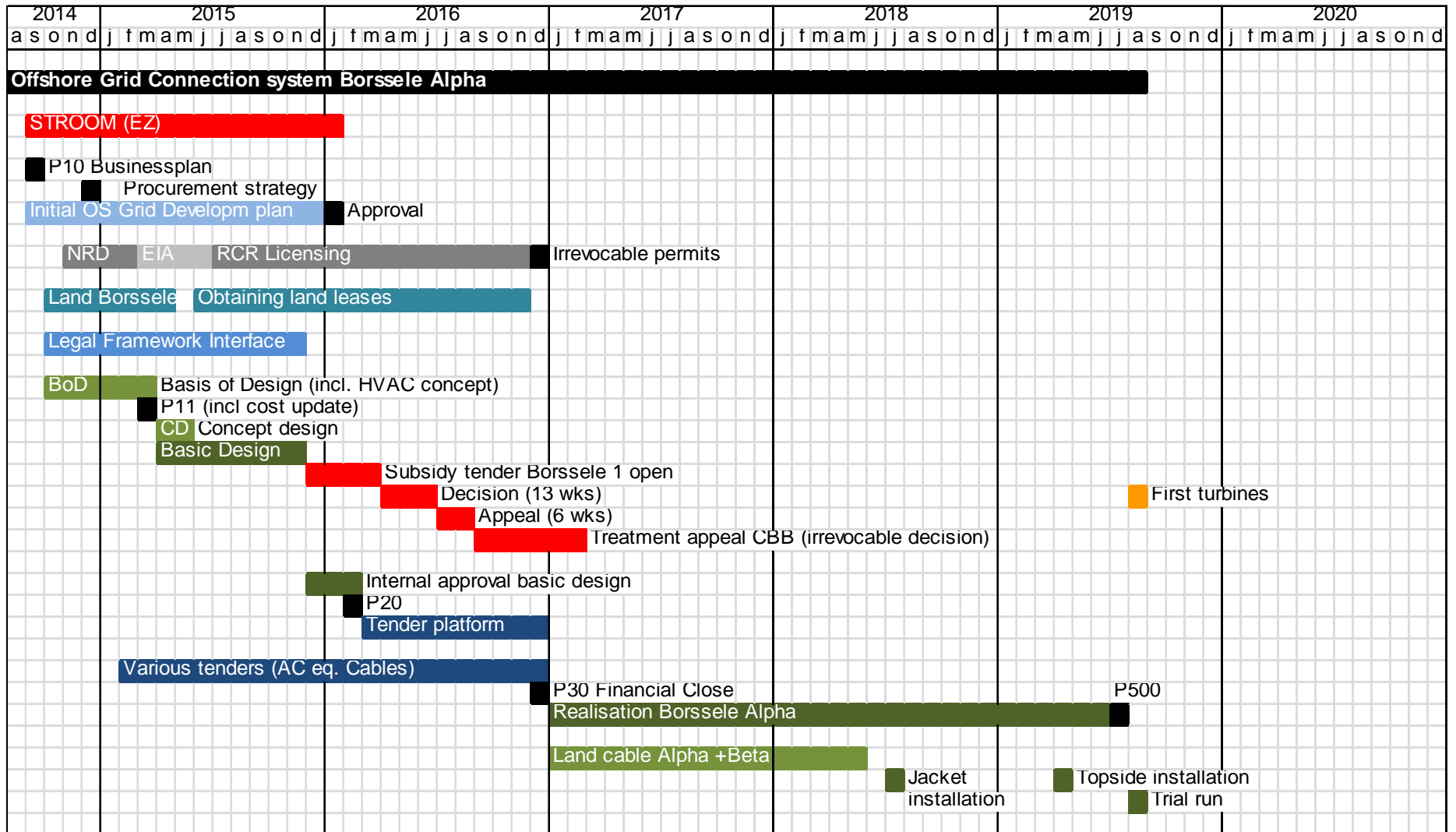


P1_Planning - consultation process

		nov	dec	jan	feb	mar	apr	may	jun	jul	sep	oct	nov		
T.1	Voltage level	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	Grey	Yellow	I. Inform
T.2	# of J tubes / bays	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	Grey	Green	D. Discuss
T.3	Point of Common Coupling	Yellow	Yellow	Yellow	Yellow	Green	Blue	Grey	Grey	Grey	Grey	Grey	Grey	Blue	N. Notify
T.4	Access to platform	Grey	Grey	Grey	Grey	Grey	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	Closed
T.5	Operation of Bays	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	Grey	
T.6	Protection	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	Grey	
T.7	Implementation RfG code	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Grey	Grey	Grey	Grey	Grey	Grey	
T.8	SCADA	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Blue	Grey	Grey	Grey	Grey	Grey	
T.9	Metering	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	
T.10	Data links / communication	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	
T.11	Overplanting	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Blue	Grey	Grey	Grey	Grey	Grey	
T.12	Redundancy / availability	Grey	Grey	Grey	Grey	Grey	Yellow	Green	Blue	Grey	Grey	Grey	Grey	Grey	
T.13	Installation interface management	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Green	Green	Green	Blue	Grey	Grey	
T.14	O&M interface management	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Green	Green	Green	Blue	Grey	Grey	
T.15	Harmonics and transient study	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Blue	Grey	Grey	Grey	Grey	
T.16	Physical coordinates	Grey	Grey	Grey	Grey	Grey	Grey	Blue	Blue	Grey	Grey	Grey	Grey	Grey	
P.1	Planning	Grey	Grey	Grey	Grey	Green	Green	Green	Green	Green	Green	Green	Green	Green	
L.1	Connection Agreement	Grey	Grey	Grey	Grey	Yellow	Green	Green	Green	Green	Green	Blue	Grey	Grey	
L.2	Initial Investment Plan	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Yellow	Yellow	Blue	Grey	Grey	Grey	
O.1	Innovation	Grey	Grey	Grey	Grey	Grey	Blue	Blue	Grey	Grey	Grey	Grey	Grey	Grey	
O.2	Stranded asset mitigation	Grey	Grey	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Blue	Grey	Grey	Grey	



P1_Planning - realisation phase





Break & lunch



L.1 Connection Agreement, Realisation
Agreement and implementation of net code
(dedicated legal session)

Discussion



L.1 Connection & realisation agreement and net code

Questions & concerns



Closure

Thank you

