







Rampion Operations and Maintenance Meet the Buyer

Pete Andrews Rampion Plant Manager

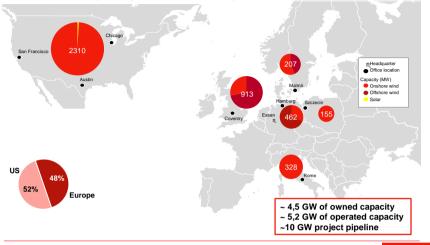


Agenda

- 1. Introduction
- 2. General O&M Strategy
- 3. Operational Timescales
- 4. Work scope breakdown

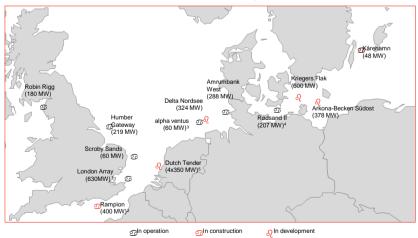
e·on

E.ON currently owns a portfolio of more than 4.5 GW wind and solar capacity across Europe and North America¹



e.on

E.ON ranks among the leading offshore wind power operators – and further developing in Offshore



E.ON share 30% (189 MW)
 E.ON share 50% (200 MW)
 E.ON share 26% (16 MW)
 E.ON share 20% (41 MW)
 Four tender in 2016 each 3501

e·on

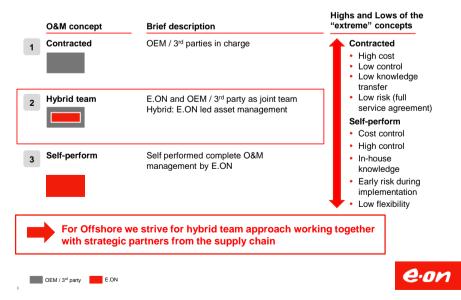
,

Agenda

- 1. Introduction
- 2. General O&M Strategy
- 3. Operational Timescales
- 4. Work scope breakdown

e.on

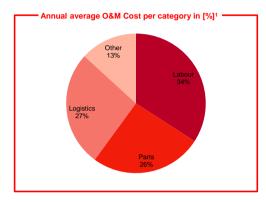
Maintenance concepts: from outsourced to insourced



Breakdown of O&M costs

Over the life of the wind farm total OPEX (operational expenditure) is approximately equivalent to the initial construction capital

50% of OPEX is variable O&M cost [remainder: leases and transmission fees]





e.on

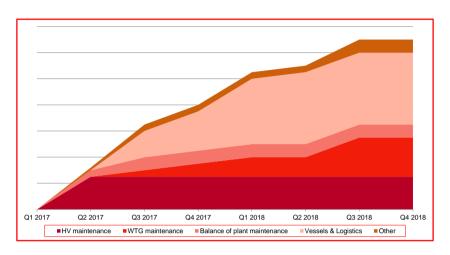
8 Typical Offshore wind farm in UK

Agenda

- 1. Introduction
- 2. General O&M Strategy
- 3. Operational Timescales
- 4. Work scope breakdown

e.on

Contract Volume Ramp-up



e.on

Agenda

- 1. Introduction
- 2. General O&M Strategy
- 3. Operational Timescales
- 4. Work scope breakdown

e.on

11

Scheduled Maintenance	Work Scope	E.ON	E.ON Subcontract	MVOW	MVOW Subcontract
Labour Consumables & Tooling Statutory inspections - Crane, Service Lift Unscheduled Maintenance Component supply Labour & Tooling Foundations - Above Water Inspections and Repair Statutory inspections of Fall Arrest Equipment Statutory inspections of Fall Arrest Equipment David cranes - Inspection, Statutory Inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Annote inspection Annote inspection Cable rouse and termination inspections Electrical BOP - Wife - Transformer/Switchgear Cables (Array & Expert) Cable status - Subsea Burial/Scour Survey Cable termination inspections Burial/Scour Survey Cable termination inspections Onshore Substation Onshore Substation Oli Sampling of the auxiliary transformer Building Integrity and Grounds Scours Burial/Scour Survey Link termination inspections Oil sampling of the auxiliary transformer Building Integrity and Grounds Scours Burial/Scour Survey Resident Inspections Oil sampling of the auxiliary transformer Building Integrity and Grounds ScADA System Hardware and Remote Access Vessels CTV supply and operation JUV Full Full WE Operations Radio VHF Communications Equipment Weather forecasting & updates Liffing Equipment Procession & VH Authorised Persons Environmental Management Scource Scource Site up keep Waste Management CCTV HVAC Site Scourty	Wind Turbine Generator (WTG)				
Consumables & Tooling Statutory inspections - Crane, Service Lift Unscheduled Maintenance Component supply Labour & Tooling Foundations - Above Water Inspections and Regair Statutory inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Anode inspection Anode inspection Anode inspection Anode inspection Selectrical BOP - WTG - Transformer/Switchgear Hv inspections and maintenance Cables (Array & Export) Periodic Subsea Inspections Burial/Scour Survey Davial/Scour Survey Disampling of the adultary transformer Disampling of the adultary tran	Scheduled Maintenance				
Statutory inspections - Crane, Service Lift Unscheduled Maintenance Component supply Labour & Toding Foundations - Above Water Inspections and Repair Statutory inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory inspection, Service Foundations - Subsea Scour assessment Grouf Seal inspection Annote inspection Cable inspection Cable inspection Cables (Arry MFC - Transformer) Cables (Arry & Expections and maintenance Burisd/Scour Survey Cable termination inspections Burisd/Scour Survey Cable termination inspections DI Sampling of the assistance DI Sampling of the assistance Budding Insperty and Grounds Scour Survey Cable termination inspections Coll sampling of the assistance Budding Insperty and Grounds Cables (Arry Survey) Cable termination inspections DI Sampling of the assistance DI Sampling of the assistance Budding Insperty and Grounds Cables (Arry Supply and operation JUV Fuel Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Liffing Equipment Meather forecasting & updates Liffing Equipment Environmental Management CCTV HVAC Site Security					
Unscheduled Maintenance Component supply Labour & Toding Foundations - Above Water Inspections and Regair Statutory inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory Inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Anode inspection Anode inspection Cable route and termination inspections Electrical BOP - WTG - Transformer/Switchgear H vinspections and maintenance Cables (Array & Export) Pendicd Subsea Inspections Burial/Scour Survey Disambling of the 33kV/132kV substation Grid Transformer Old sampling of the adultary transformer Disampling of the Maillary transformer Disampling of the Maillary transformer Disampling of the Adultary transformer Disampling of the Adultary transformer Disampling of the Adultary transformer Disampling of the Maillary transformer Disampling of the Maillary transformer Disampling of the Adultary transformer Disampling of					
Component supply Labour & Tooling Foundations - Above Water Inspections and Repair Statutory inspections of Fall Arrest Equipment Davit cranse - Inspection, Statutory inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Anode inspection Anode inspection Cabbe route and termination inspections Electrical BDP - WfiG - Transformer/Switchgear HV inspections and maintenance Cabbes (Array & Expert) Cabbe formination inspections Districts Subsea Subsea Districts Subsea					
Labour & Tooling Foundations - Above Water Inspections and Regair Statutory inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Anode inspection Cable route and termination inspections Electrical BOP - WTG - Transformer/Switchgear HV inspections and maintenance Cables (Array & Export) Periodic Subsea Inspections Burial/Scour Survey Davial/Scour Survey Davial/Scour Survey Disampling of the 338V/1328V Substation Grid Transformer Disampling of the adultary transformer Disampling of the adultary transformer Building Integrity and Grounds CASOA System Hardware and Remote Access Vessels CTV supply and operation Fixed WF Operations Radio VHF Communications Equipment Water Survey Survey Wester Survey Revision of HV Authorised Persons Environmental Management Environmental Management Environmental Management Environmental Consert monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Sourity					
Foundations - Above Water Inspections and Repair Statutory (inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory Inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Anode inspection Anode inspection Cabbe route and termination inspections Electrical BoP - Wife - Transformer/Switchgear HV inspections and maintenance Cables (Array & Export) Periodic Subseal Inspections Subseal Scour Survey Burlat/Scour Survey Survey Onshore Substation Onshore Substation Oil Sampling of the salk/Vis2kV Substation Grid Transformer Oil sampling of the salk/Vis2kV Substation Grid Transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JUV Fyel We Operations Radio VHF Communications Equipment Weether forecasting & updates Lifting Equipment Weether forecasting & updates Lifting Equipment Weether forecasting & updates Environmental Management Environmental Management Environmental Management CCTV HVAC Site because Site up keep Waste Management CCTV HVAC Site Sourity	Component supply				
Inspections and Repair Statutory Inspections of Fall Arrest Equipment Davit cranes - Inspection, Statutory Inspection, Service Foundations - Subsea Scour assessment Grout Seal inspection Anode inspection Bellettical BOP - WTG - Transformer/Switchgear Hv Inspections and maintenance Cables (Array & Export) Periodic Subsea Inspections Buris/Scour Survey Periodic Subsea Inspections Buris/Scour Survey Disampling of the assistance of the subsections Disampling of the assistance of the subsections Disampling of the assistance of the subsections Burisding Integrity and Grounds Excellent Another Survey Wessels CTV supply and operation If you will be a subsection of the subsection of th	Labour & Tooling				
Statutory inspections of Fall Arreat Equipment Davit cranse - Inspection, Statutory Inspection, Service Foundations - Subsea					
Davit cranes - Inspection, Statutory Inspection, Service Foundations - Subsea Socur assessment Grout Seal inspection Anode inspection Anode inspection Cable route and termination inspections Electrical BOP - WTG - Transformer/Switchgear HV inspections and maintenance Cables (Array & Export) Periodic Subseal Inspections Burial/Scour Survey Cable termination inspections Onshore Substation JU Sampling of the assulinary transformer Dil sampling of the assulinary transformer Building integrity and Grounds SAUX Switchgear Inspections Cable termination and Remote Access CTV supply and operation JUV WE Operation JUV WF Operation JUV WF Operation JUT WF Operation JUT WF Operation JUT WF Operation JUT WF Operation Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Management Environmental Management Environmental Management Environmental Management CCTV HVAC Site Security					
Foundations - Subsea Sour assessment Grout Seal inspection Anode inspection Anode inspection Cable route and termination inspections Electrical 80 P - WTG - Transforms/Switchgear HV inspections and maintenance Cables (Array & Export) Periodic Subsea Inspections Buria/Scour Survey Cable termination inspections Onshore Substation 334V Switchgear Inspections Oil sampling of the 334/V1324V Substation Grid Transformer Oil sampling of the auxiliary transformer Burling Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation UV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Wardhouse vehicles PFE Proxion of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security					
Scour assessment Grout Seal inspection Cable route and termination inspections Cables (Array & Export) Cable termination inspections Cables (Array & Cable termination inspections Cable termination Cable termina	Davit cranes - Inspection, Statutory Inspection, Service				
Grouf Seal Inspection Anode Inspection Cable route and termination inspections Electrical 8D - WTG - Transforms/Switchgear HV Inspections and maintenance Cables (Array & Export) Periodic Subsea Inspections Burial/Scour Survey Cable termination inspections Onshore Substation 334V Switchgear Inspections Oil Sampling of the 334/V1324V Substation Grid Transformer Oil sampling of the 334/V1324V Substation Grid Transformer Uil sampling of the auxiliary transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation UIV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Liffing Equipment Warehouse vehicles PPE Proxision of HV Authorised Persons Environmental Management Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security					
Anode inspection Cable route and termination inspections Electrical BOP - WTG - Transformer/Switchgear HV inspections and maintenance Cables (Array & Export) Periodic Subsea Inspections Burial/Scour Survey Cable termination inspections Onshore Substation Onshore Substation Onshore Substation On Sampling of the auxiliary transformer Oil sampling of the auxiliary transformer Building integrity and Grounds Substation CTV supply and operation ILIV Forestors WF Operations WF Operations MI Supply and operation Equipment Marchayer and Remote Access Extremely Substation WF Operations Marchayer Substation Marchayer Substation Marchayer Substation Equipment Warchayer substation Marchayer Substation Marchayer substation Environmental Management CCTV HVAC Site Security					
Cable route and termination inspections Electrical BOP _ WTG - Transforms/Switchgear HV Inspections and maintenance 2bles (Array & Export) Periodic Subsea Inspections Burlat/Scour Survey Cable termination inspections Onshors Substation 334V Switchgear Inspections Oil Sampling of the 334V/1324V Substation Grid Transformer Oil sampling of the auxiliary transformer Burling Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation UV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Siste Security	Grout Seal inspection				
Electrical BOP - WTG - Transformer/Switchgear H VI respections and maintenance Cables (Array & Export) Perfordic Subsea Inspections Burial/Scour Survey Cable termination inspections Onshore Substation 334V Switchgear Inspections Oil Sampling of the 334V/1324V Substation Grid Transformer Oil sampling of the auxiliary transformer Building Integrity and Grounds SLOAD System Hardvare and Remote Access CTV supply and operation JILV WF Operations Radio VHF Communications Equipment Verses Radio VHF Communications Equipment Well Suffring Equipment Well Supposed Well Supposed Well Supposed PPE Proxision of HV Authorised Persons Environmental Management Environmental Management Environmental Management Environmental Management CCTV HVAC Site Security	Anode inspection				
HV Inspections and maintenance Ables (Array & Export) Periodic Subsea Inspections Burlar/Scour Survey Cable termination inspections Onshore Substation 334V Switchgear Inspections Oil Sampling of the 334V/1324V Substation Grid Transformer Oil sampling of the 334V/1324V Substation Grid Transformer Burlaing Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTY supply and operation UV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Wardhouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security					
Cables (Array & Export) Periodic Subseal Inspections Burlat/Scour Survey Cable termination inspections Onshore Substation 3xV switchpear Inspections Oil Sampling of the 3xW/13xW Substation Grid Transformer Oil sampling of the auxiliary transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JILV WE Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Weather forecasting & updates Lifting Equipment PPE Proxision of VH Authorised Persons Environmental Management Environmental Management Environmental Consent monitoring Operations Site up keep Waste Management CCTV HVAC Site Security					
Periodic Subsea Inspections Burlat/Scour Survey Cable termination inspections Onshore Substation 334V Switchgaar Inspections Oil Sampling of the 334V/1324V Substation Grid Transformer Oil sampling of the 334V/1324V Substation Grid Transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JUV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Juffing Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security					
Burlat/Scour Survey Cable termination inspections Onshore Substation 33kV Switchpear Inspections Oil Sampling of the 33kV/13kV Substation Grid Transformer Oil sampling of the auxiliary transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JILV WE Operations Radio VHF Communications Equipment Weather forecasting & updates Liffing Equipment President Substations JITM Equipment Substations Environmental Management Environmental Management Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security					
Cable termination inspections Onshore Substation 334V Switchpaar Inspections Oil Sampling of the 334V/1324V Substation Grid Transformer Oil sampling of the 334V/1324V Substation Grid Transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation UV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Liffring Equipment Wardhouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security	Periodic Subsea Inspections				
Onshore Substation 3xW Switchpear Inspections Oil Sampling of the 3xW/13xW Substation Grid Transformer Oil sampling of the auxiliary transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JUV LIV Fuel WE Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Differentiation of the Communications of the	Burial/Scour Survey				
334V Switchpear Inspections Oil Sampling of the 334V1324V Substation Grid Transformer Oil sampling of the 334V1324V Substation Grid Transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JUV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Jiffing Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Management Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAG Site Security	Cable termination inspections				
Oil Sampling of the 338V/1328V Substation Grid Transformer Oil sampling of the auxiliary transformer Building Integrity and Grounds SCADA System Hardware and Remote Access (STV supply and operation JUV Fuel WE Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment JUT Fuel Fuel Fuel Fuel Fuel Fuel Fuel Fuel	Onshore Substation				
Dil sampling of the auxiliary transformer Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JUV Fuel WFOperations Radio VHF Communications Equipment Weather forecasting & updates Jiffring Equipment Wardhouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	33kV Switchgear Inspections				
Building Integrity and Grounds SCADA System Hardware and Remote Access Vessels CTV supply and operation JUV Fixed Fixed WE Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Warehouse verbicles Fixed on VHY Authorised Persons Environmental Management Environmental Management Department Environmental Management Extra Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security	Oil Sampling of the 33kV/132kV Substation Grid Transformer				
SCADA System Hardware and Remote Access					
Vessels CTV supply and operation JUV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Weather forecasting & updates Environmental Management Environmental Consent monitoring Operations Base Waste Management CCTV HVAC Site Security	Building Integrity and Grounds				
CTV supply and operation JUV Fuel WF Operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Management Operations Base Site up keep Waste Management CCTV HVAC Site Security	SCADA System Hardware and Remote Access				
JUV Fuel WE Operations Radio VHF Communications Equipment Weather forecasting 8 updates Jifing Equipment Weather forecasting 8 updates Jifing Equipment Weathouse vehibrides PPE Provision of HV Authorised Persons Environmental Management Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Vessels				
Fuel WF operations Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	CTV supply and operation				
WF Operations Radio VHF Communications Equipment Weather forecasting & updates Unified Equipment Warehouse vehicles PFE Provision of HV Authorised Persons Environmental Management Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Liuv				
Radio VHF Communications Equipment Weather forecasting & updates Lifting Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Fuel				
Weather forecasting & updates Lifting Equipment Warehouse vehicles PPE Proxision of HV Authorised Persons Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	WF Operations				
Lifting Equipment Warehouse vehicles PPE Provision of HV Authorised Persons Environmental Management Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Radio VHF Communications Equipment				
Warehouse vehicles PPE PPE Provision of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Weather forecasting & updates				
PPE Provision of HV Authorised Persons Provision of HV Authorised Persons Environmental Management Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Lifting Equipment				
Proteion of HV Authorised Persons Environmental Management Environmental Consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Warehouse vehicles				
Environmental Management Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	PPE				
Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security	Provision of HV Authorised Persons				
Environmental consent monitoring Operations Base Site up keep Waste Management CCTV HVAC Site Security					
Site up keep Waste Management CCTV HVAC Site Security					
Waste Management CCTV					
CCTV HVAC Site Security	Site up keep				
CCTV HVAC Site Security	Waste Management				
Site Security Site Security					
	HVAC				
	Site Security				
	Cleaning services				

e.on

ANY QUESTIONS?

e·on