

# Development Roadmap DHES

## Relevant aspects / issues during development

	1. Opportunity Qualification	2. Business Case	3. Feasibility FD & TD	4. Planning, Permission & Organization	5. Financial Closing	6. Building DHES
Activities	Define the need 'pains' and 'gains' Involve all possible stakeholders	Basic information regarding cost. Make a calculation Start with a A5 Then a more extensive version	Design a 'TD', based on the 'FD' in RET Screen	High level check on legislation. External check and check subcontractors	Define financial configuration & find partners / sources	Final order subcontractors. Monitor development
Specific Checks	1 Problem?, 2 Solution? 3 Problem holder? 4 Budget? 5 Urgency? 6 Scalability?	1 Financial feasibility? 2 Is there a business case? 3 What are the financial issues?	1 Financial feasibility? 2 Is there a business case? 3 What are the financial issues?	1 Check on external feasibility. Secondary conditions. Subcontractors & equipment available	Find: - Equity partners - Debt partners	Check on planning and progress
Tool(s)	OGTC assessment tool	OGTC Checklist RETscreen	Homer	Online tools	Financial tools	Asana – MS project
Output / Results	Assessment of business opportunity	Site assessment Business Case	Functional and Technical design	Permits Quotes contractors Project plan	Financial structure Contracts	Reports
Go / No go	Minimal 5 answers should have the answer 'yes'	OK on business case	OK on technical feasibility	OK on secondary conditions and legislation	OK of partners Finance available	Subcontractors do not deliver
Issues Show Stoppers	Stakeholder obstruction	Financial issues: funding – risks – extra cost	Technical issues	No permits – slow permit process – no decision is made	Final go investment	Delay – bad quality
Costs	Time investment	Time investment	'Out of pocket' Investment	'Out of pocket' Investment	'Out of pocket' Investment	Cost of outsourcing

## Inventarisation site and conditions

Site data	Stand alone/hybrid/farm:		
	Address:		
	Coordinates:		
Wind data	Avg. Windspeed (Year/season/day/hour)		[m/s]
	Ref. height		[m]
	Turbulence expected		[%]
	Shear		[%]
	Wind report present?	[yes/no]	
Sun data	Solar irradiance (Year/Season/Day/hour)		kW/m2
	Available surface for panels		m2
	Type of location (roof/ground)		
	Solar report present?	[yes/no]	
Location	Terrain Rough		[Class]
	Protected area	[yes/no]	
	Environmental matters (eg. Bats, birds)	[yes/no]	
	Hurricane/earthquake sensible?	[yes/no]	
	Distance to sea/ocean ≥5km	[yes/no]	
	Ascertain cables/pipes in ground	[unknown/present]	
	Ascertain cables/pipes in ground	[yes/no]	
Climate	Min/Max temperature		[°C]
	Humidity (avg.)		[%]
	Extensive lightning expected	[yes/no]	

Plan. perm.	Permit submitted		[date]
	Expected date go/no go on permit		[date]
	Special requirements (obstr light/colour etc.)		[yes/no]
	Additional permits needed?		[yes/no]
Grid con.	Distance to grid		[m]
	New grid connection needed?		[yes/no]
	Grid requirements (UL/G59/BDEW/etc)		
	Grid frequency & voltage		
	Transformer required?		[yes/no]
Financial:	Payback period desired		[years]
	IIR desired		%
	Need for financing		
	Own resources		
	FIT regulation (how much per kWh)		[yes/no]
	Subsidy regulations/facilities		
Energy	Inflation rate		[%]
	Load pattern (season/month/week/day)		
	Peak load / Base load		[kWh]
	Energy usage per year		[kWh]
	Current usage of the grid energy		
	Current usage of diesel energy		
	Costs of grid energy per kWh		
Costs of diesel energy per kWh			

## Inventarisation installation/commissioning/maintenance

Logistics	Restrictions for unloading (harbour)	[yes/no]
	Restrictions road (curves/bridges etc)	[yes/no]
	Road suitable to site for transport?	[yes/no]
	Site free accesible?	[yes/no]
	Crane load on site problematic?	[yes/no]
	Special packaging required?	[yes/no]
Contr. room	Watertight & ventilated	[yes/no]
	Corrosive environment?	[yes/no]
	Temperature conditioning required?	[yes/no]
	Specify distance tower-control cabinet if $\geq 10m$	[m]
Specials	Obstruction light required?	[yes/no]
	Special colour scheme required?	[yes/no]
	Smart grid box	[yes/no]

Contracting	Local contractor hoisting available	[yes/no]
	Local contractor civil available	[yes/no]
	Local contractor mechanical available	[yes/no]
	Local contractor electrical available	[yes/no]
Mile stones	Wind report site	[date]
	Sun report site	[date]
	Development business case	[date]
	Permit obtained	[date]
	Project financing	[date]
	Grid connection	[date]
	Delivery of components of DHES	[date]
	Installation of DHES	[date]
Commisioning DHES	[date]	

Remarks