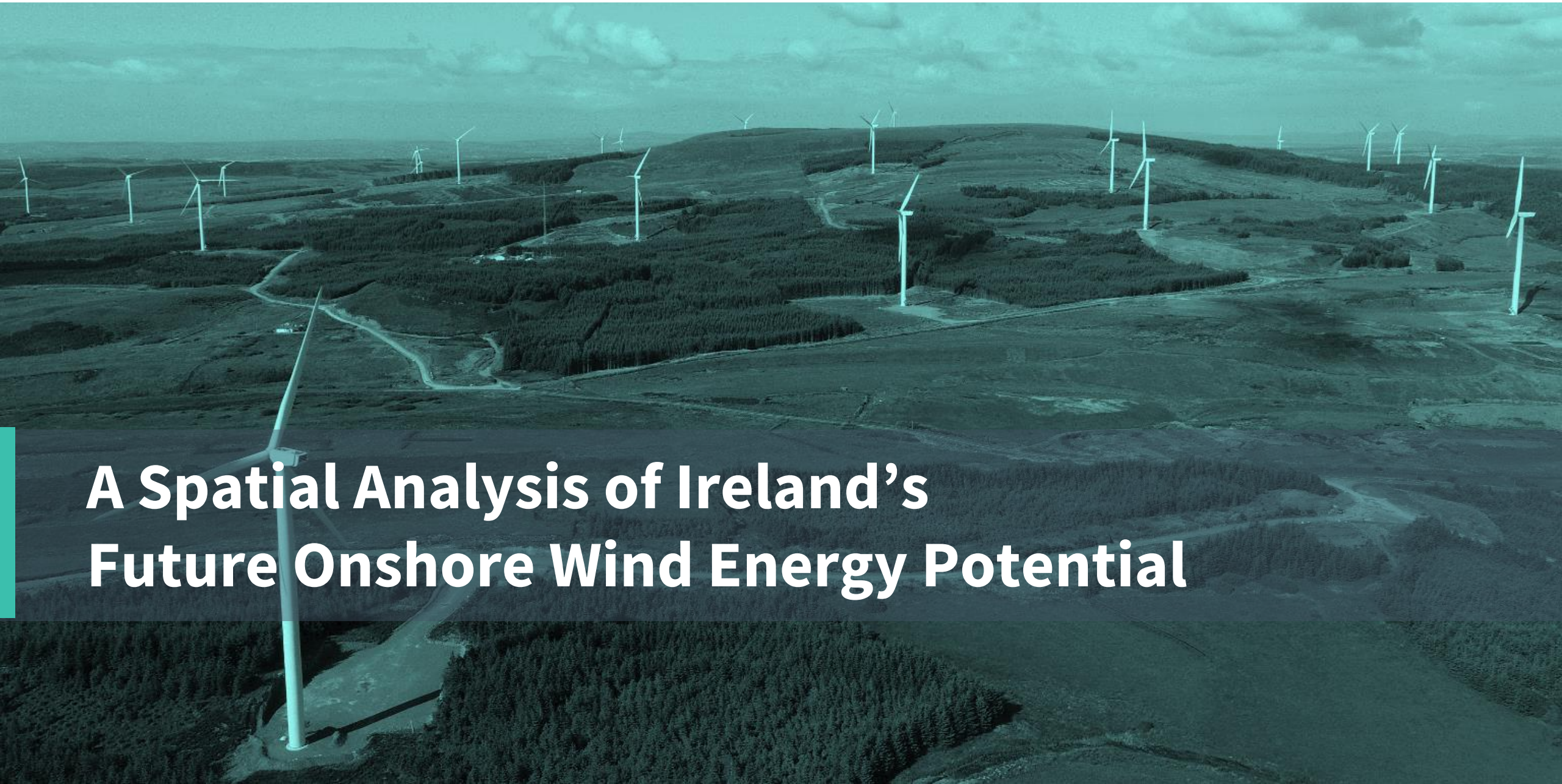
MKO Planning and Environmental Consultants



A Spatial Analysis of Ireland's Future Onshore Wind Energy Potential

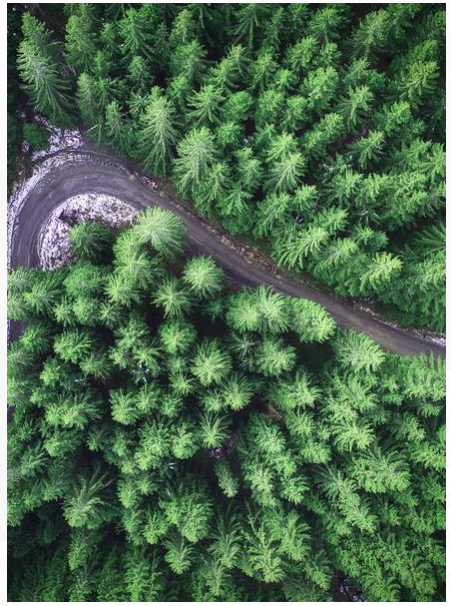
About MKO

- **Planning & Environmental** consultants
- Over **1GW** of onshore wind energy project experience
- **55 professionals** working across **5 teams**

Planning

Environmental

Ecology



Ornithology

Estates & Project Management

Perception Vs. Reality

The Perception…

"There's no more land left"

"Future onshore potential is limited"

"All the good sites are taken"

"Onshore wind can't deliver the GWs needed"

"We have to go offshore"

But what's the reality?

The current policy “bar”

The existing policy environment has delivered what we have today.

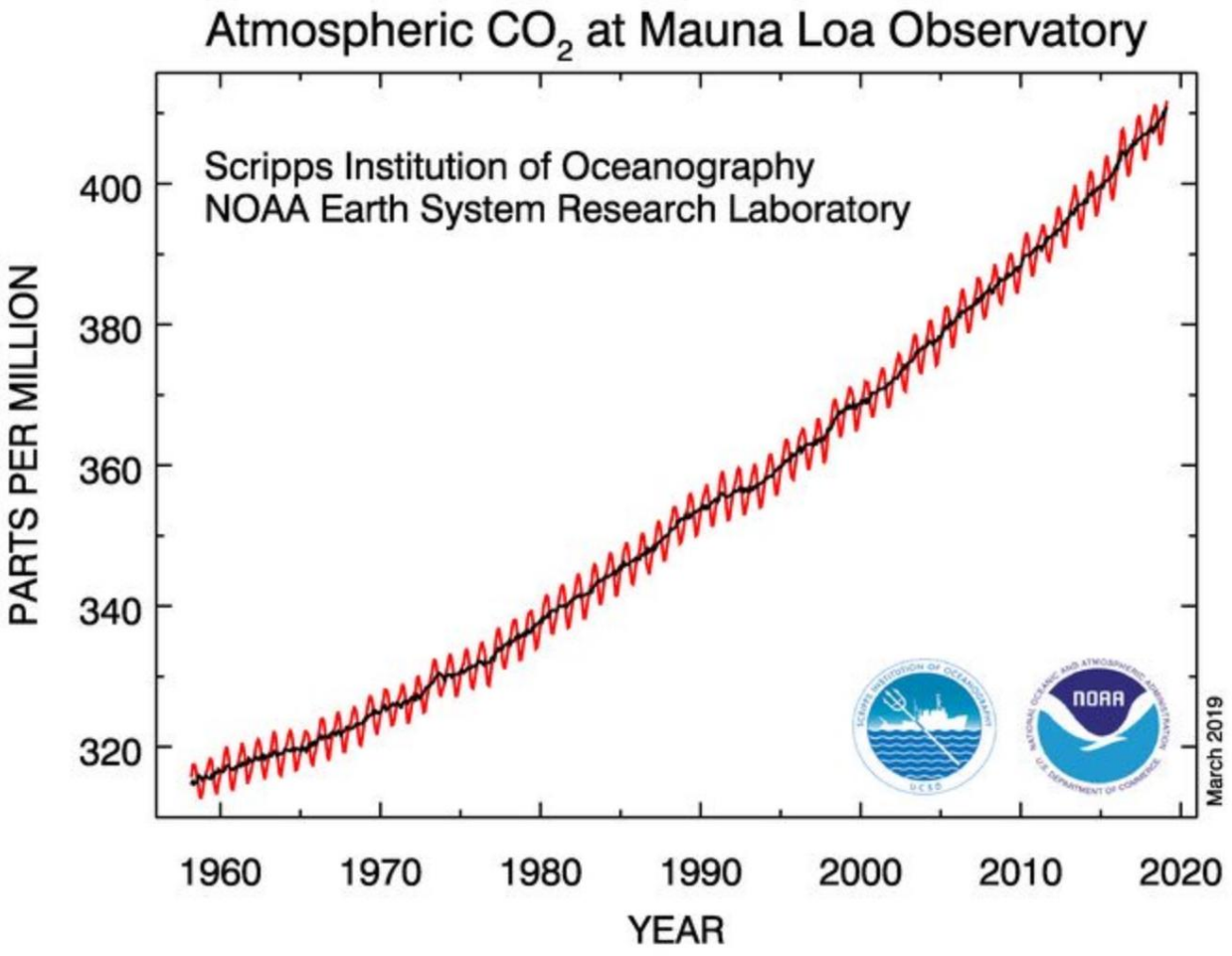
Direct policy examples:
- Planning
- Grid
- WEGs
- REFIT / RESS

Indirect policy examples:
- Government ambition
- Political leadership
- Community support
- EU Clean Energy Package
- NREAP

If the policy bar stays where it is, we might hit 40% RES-E by 2020, but we WILL also run out of land.

A different set of policies will be required to go as far as we need to go.

The scale of challenge ahead



Not if, but **how far** beyond 40% are we going?

Not just RES-E, all energy!

The bar just **can't stay where it is**!

Two Options

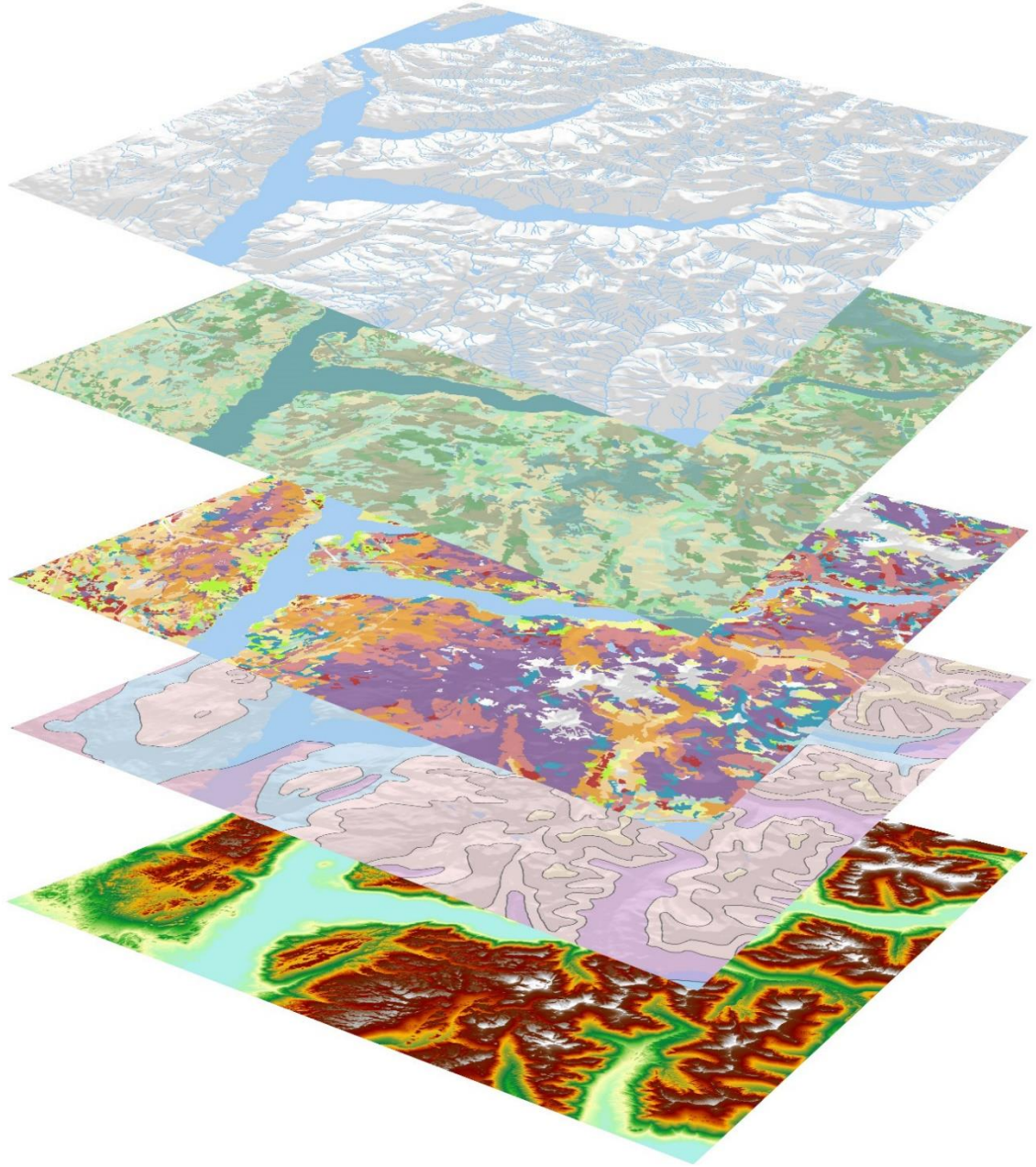
1. Clear policy ambition for onshore wind
2. Limits reached by accident, not design

Can onshore wind deliver?
If so, to what extent?

Methodology

A **four-step** **GIS-based** methodology was used:

1. Physical & environmental constraints
2. Housing & properties
3. Existing, permitted & proposed wind farms
4. Capacity assessment



Physical and environmental constraints

Study area - 26 ROI Counties

“No go” areas

Constraints that make areas unsuitable for wind farms

- ✓ Ecological protection areas SACs, SPAs, NHAs, pNHAs
- ✓ Rivers + 50m buffer
- ✓ Lakes + 100m buffer
- ✓ Small town perimeters + 2km buffer
- ✓ Larger towns & cities + 5km buffer
- ✓ National roads Motorways, national primary & secondary roads
- ✓ Rail network +150m buffer
- ✓ Electricity transmission network +100m buffer

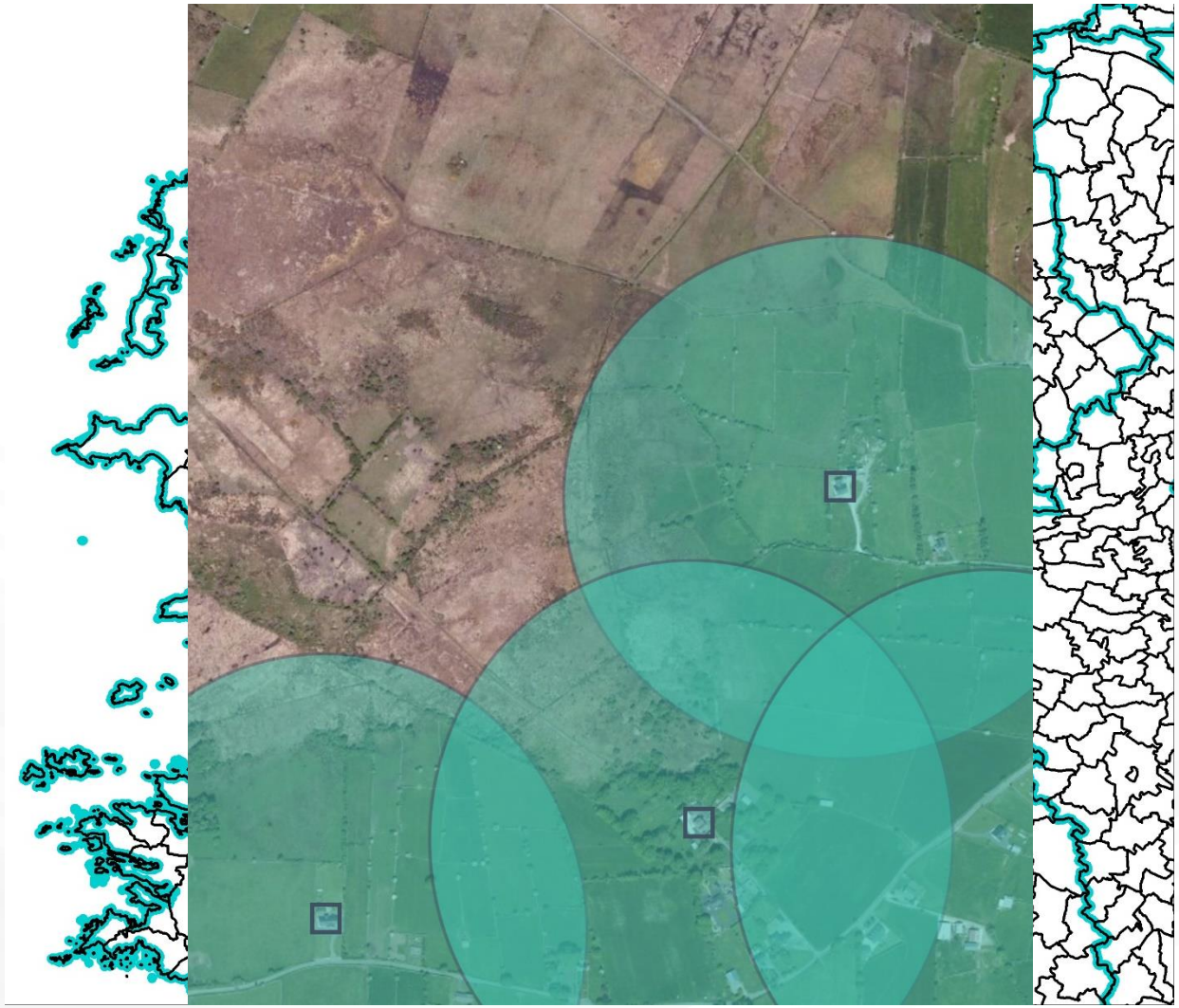
Not considered

(Relevant to wind farm developments, but not to this study)

- *Wind energy policies*
- *Landscape policy*
- *Grid capacity*
- *Site design constraints*

Policy instruments that can change; technical constraints that can be eliminated; or design constraints than can worked around.

Housing and properties



Two-step process:

Firstly, using Electoral Division areas (EDs) and CSO data to assess housing density

- Electoral Divisions are the smallest legally defined administrative areas in the state for which Small Area Population Statistics are available
- 3,440 legally defined EDs

< 11 houses per km^2 cutoff

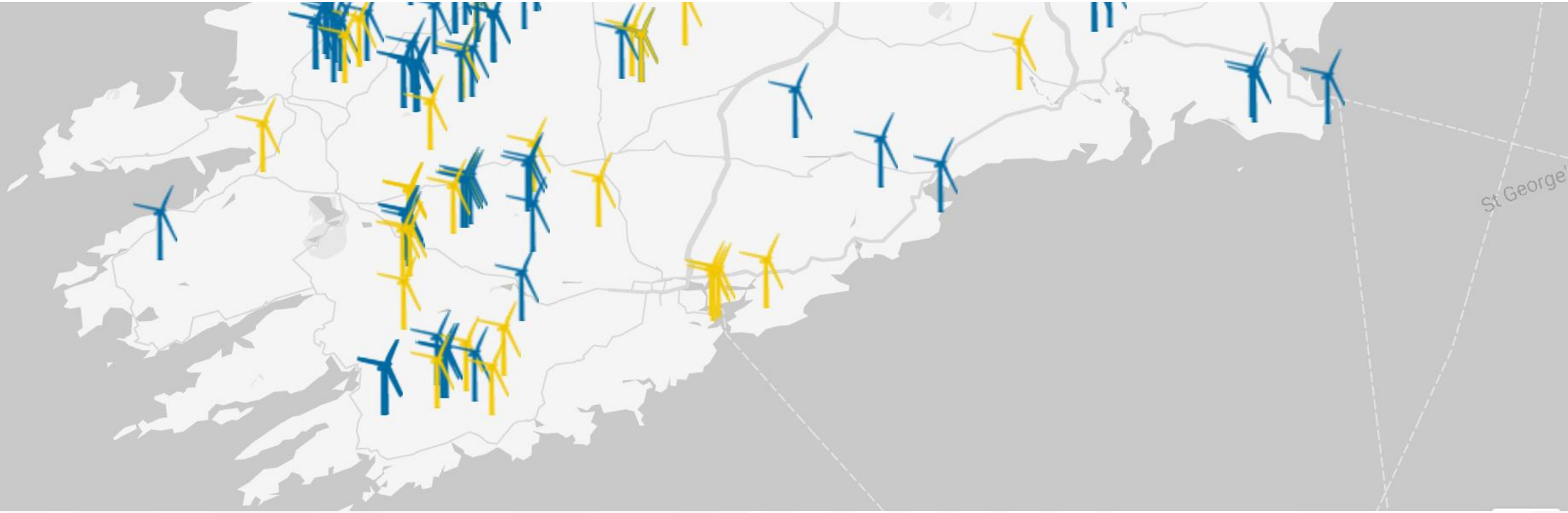
Secondly, Eircode data used to map every property in Eds <11 houses/km^2

All properties buffered by 600m

- x4 setback of 150m turbine
- A proxy for noise and shadow flicker setback
- Site-specific requirements may differ

Existing wind farm sites

Turbines individually mapped in all operational (connected) and proposed/permitted (contracted) wind farms



- Anything connected or contracted considered land on which capacity has already been established and taken
- Turbine locations buffered by 300m
- Repowering potential NOT considered in this exercise

Capacity assessment

Three sets of constraints **combined**

- Physical & environmental; Housing & property; Existing wind farms.

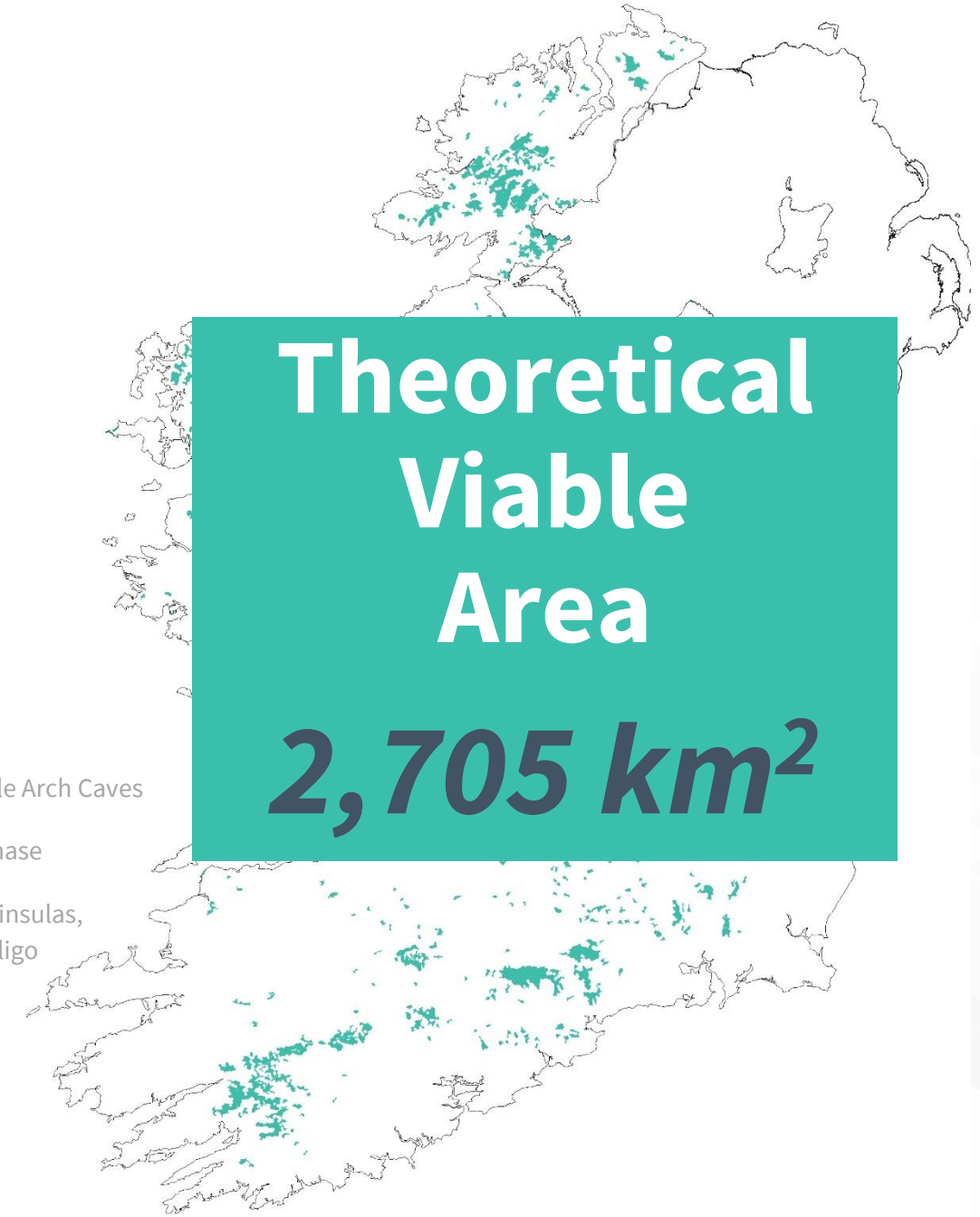
Subjective analysis

Areas that in good faith, should not be expected to accommodate wind farms

- ✓ Lands on seaward side of W.A.W.
- ✓ Unesco World Heritage Sites Newgrange & Brú na Bóinne
- ✓ Unesco Global Geoparks Burren & Cliffs of Moher; Copper Coast, Marble Arch Caves
- ✓ Key archaeological sites Clonmacnoise, Rock of Cashel, Rock of Dunamase
- ✓ Renowned scenic landscapes Ring of Kerry, Dingle & Beara Penninsulas, Connemara, Glendalough; North Sligo

Small area filter

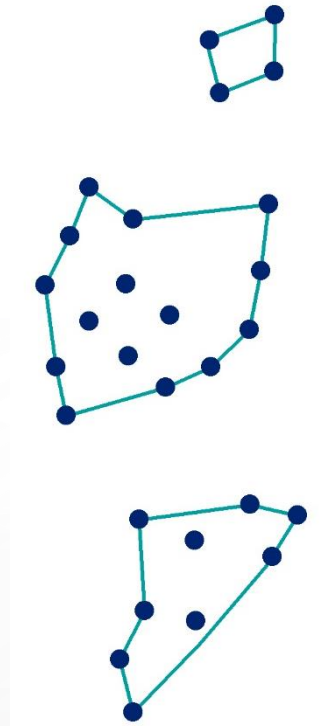
- Excluded any areas less than **1km²** from further consideration



Theoretical Viable Area

2,705 km²

Capacity assessment



Current **MW/km²** installed capacities

- 8 No. 20+MW projects commissioned in 2017/2018
- Projects designed and permitted under 2006 WEGs
- 2 excluded (very high)
- Average installed capacity of remaining 6 ….

> **25MW/km²**

Conversion Factor

The percentage of the theoretical viable area that it might be realistically feasible

Intended to take account of:

- ✓ Landowner consent
- ✓ Appropriate planning policy
- ✓ Feasible grid connection
- ✓ Planning consent / Judicial review
- ✓ Route to market

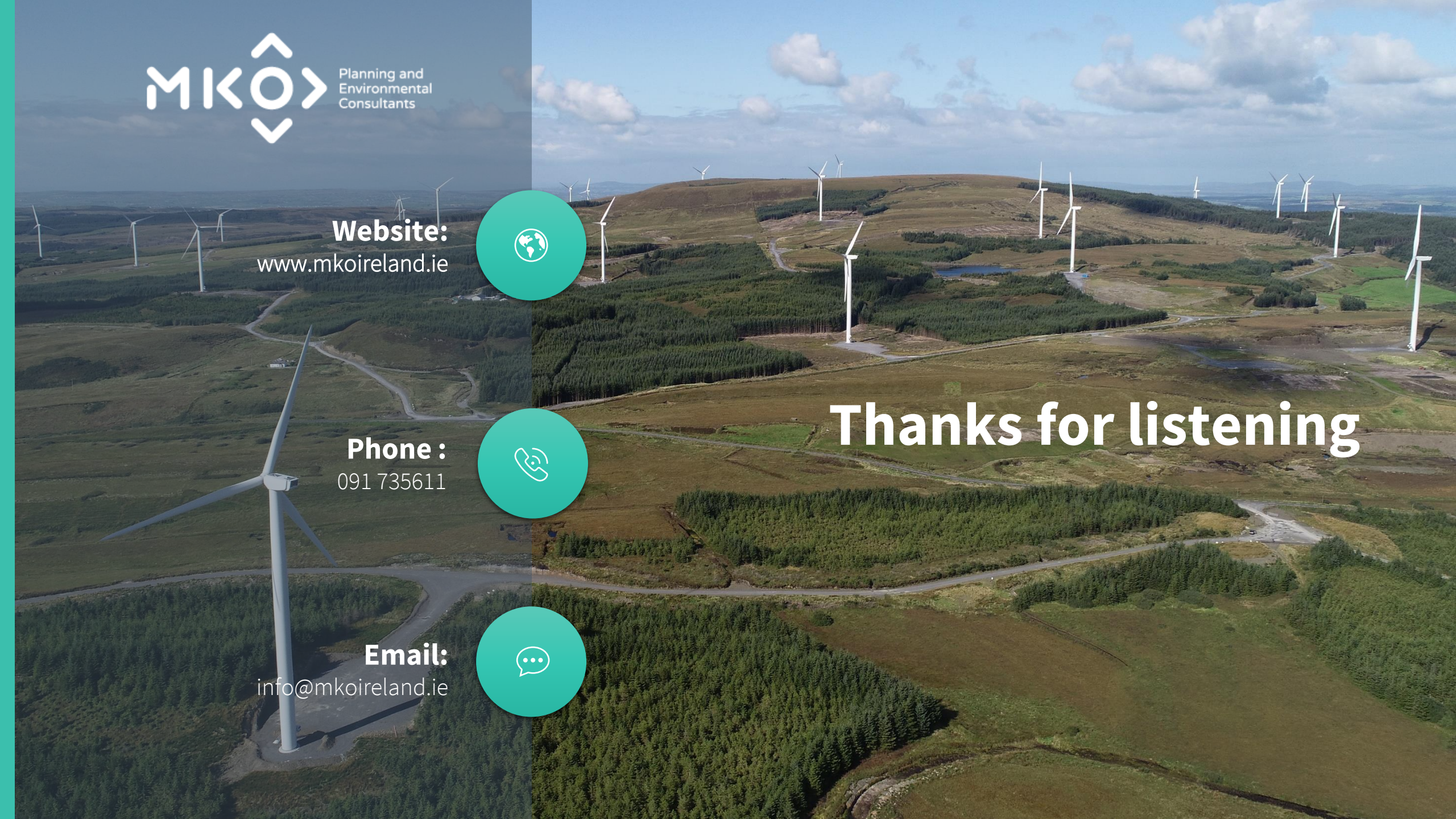
> **10%**

Future onshore wind energy potential

Three capacity **scenarios** developed based on different **conversion factors.**

	Low	Medium	High
Theoretical Area	**2,705km²**		
Conversion Factor	5%	**10%**	15%
Realistic Area	135km²	**270km²**	405km²
MW/km²	**WEGs Dependant**		
Total MW	**Ambition Dependant**		

Future onshore wind energy potential


Planning and Environmental Consultants
Website:
www.mkoireland.ie
Phone :
091 735611
Email:
info@mkoireland.ie
Thanks for listening