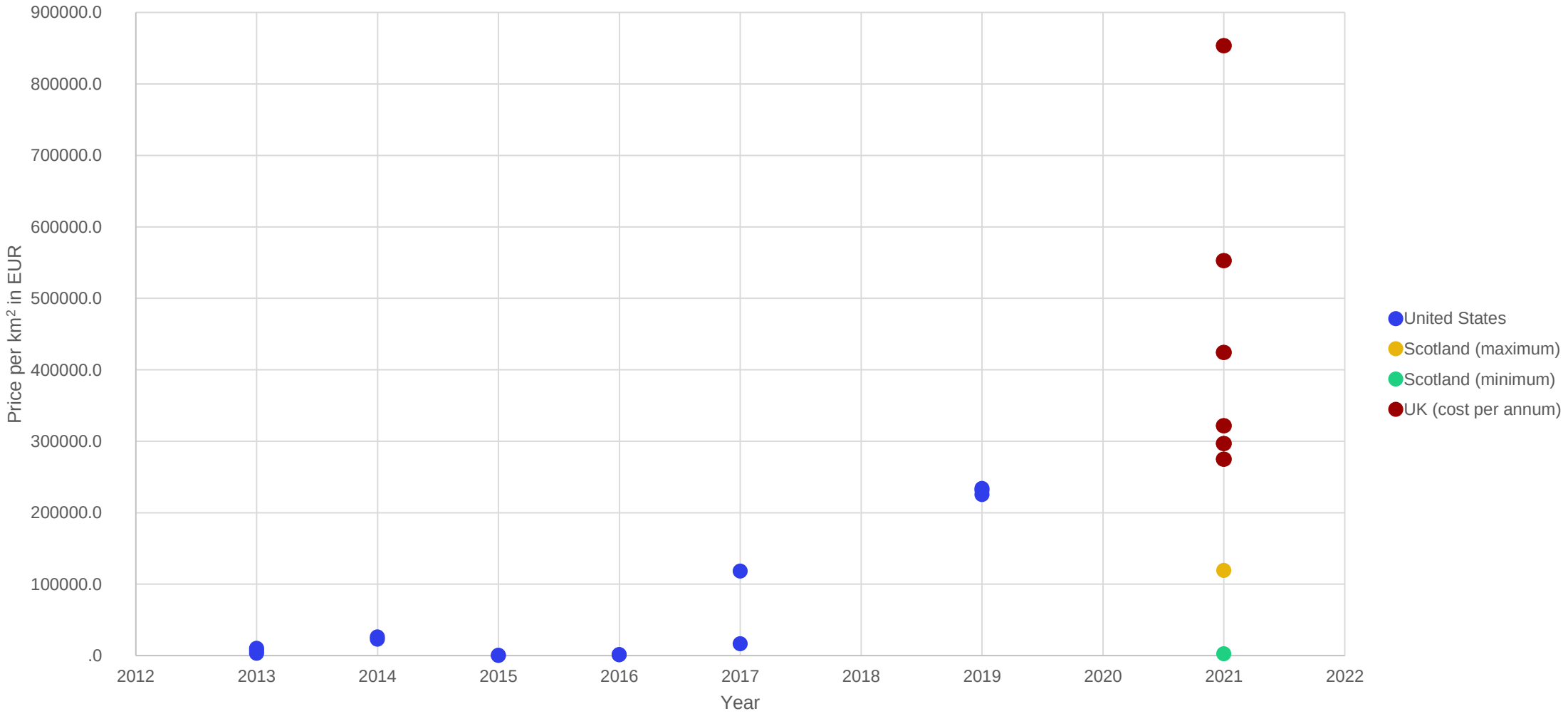
Overview of seabed lease structures

# Seabed Leases

# Introduction

- Technological change -> offshore wind is becoming more competitive
  - Potentially economical seabed is expanding
  - Lowest CfD auction price might not work as a decision criteria
- Potential solution: including option fees for seabed leases
  - **Owned by the state**
    - Potential for optimization by the state
  - **Scarce and valuable resource**
    - Lack of available sites could become a constraint
  - **Varying “quality”**
    - Auction can reveal true value
- Presentation gives an overview of 4 jurisdictions and the incentives

# Comparison of Option Prices



# United Kingdom; England, Wales & Northern Ireland

| Incentivized | Disincentivized |
|---|---|
| Reaching COD fast | Density |
| Innovation | Marginal turbines |
| | Marginal production |

- Competitive auctions
  - Qualitative pre-qualification
  - Multiple sites with a multi-round auction
  - One site awarded per round
  - **Decision criteria is highest £/MW/year**
  - **3 MW/km$^2$ minimum density**
- Pre-generation: rent worth the lesser of
  - the annual option fee instalment or
  - **base rent: 0.9£*80% of the average expected annual production**
- Generation: rent will be the greater of
  - **2% of revenue**
  - base rent
  - 80%*average fee over previous 2 years during production.
- Up to 50% reduction on rent on up to 10% of capacity that is innovative

# United Kingdom; Scotland

| Incentivized | Disincentivized |
|---|---|
| Density | Marginal production |

- Competitive contests
  - Qualitative pre-qualification
  - Multiple sites
  - 15 sites with maximum 860 $km^2$ per site
  - **Qualitative & quantitative** decision criteria
    - Qualitative criteria to divide applicants into 3 ranked categories
    - Option fee determines winner if same rank
  - Minimum density of 1 MW/ $km^2$
  - **Option fee starts at 2000 £/$km^2$ up until 100,000 £/$km^2$**
- Rent: during generation
  - **£1.07/MWh indexed to CPI**

# Netherlands

| Incentivized | Disincentivized |
|---|---|
| Overplanting (especially relative to previous countries) | |

- Competitive contests/auctions
  - Qualitative pre-qualification
  - One site per contest
  - **Zero subsidy bids submitted -> qualitative decision criteria**
  - No zero subsidy bids submitted -> auction phase starts
    - Last large offshore wind project with subsidy Borssele III&IV (2016)
- Reservation fee & Operating fee
  - Applied based on % of area within 12-mile zone
  - Expected capacity is fixed
    - Maximum transmission capacity may be slightly higher
  - Pre- & post-generation: 650€/MW/year indexed before and after operation
  - Generation: 4000h*0.98€/MW/year indexed during operation

# United States

| Incentivized | Disincentivized |
|---|---|
| Density | Marginal production |
| Holding onto lease areas waiting for better conditions | |

- Competitive auctions
  - Qualitative pre-qualification
  - Sites can later be rearranged
  - Single or multiple site multi-round auction
  - **Decision criteria is highest $ for the area**
- Rent: during pre-generation
  - **3 $/acre (741 $/km$^2$)**
- Operating fee: during generation
  - **2% of revenue assuming weighted average yearly price**
    - Weights are fixed, making it an independent variable fee
    - Weights vary by contract, but roughly 0.48 weight for off peak and 0.52 for peak hours


DTU

# Overview

| Country | Auction Awarded | Pre-generation | Generation | Decommissioning |
|---|---|---|---|---|
| UK; England,Wales & Northern Ireland | | £76-£154/GW per year (latest) + 0.8 * expected output * 0.9£/MWh | Higher of<br>• 2% revenue<br>• 0.8 * expected output * 0.9£/MWh<br>• 0.8 * expected output * fee based on historical revenue | |
| UK; Scotland | £2000-£100,000/km^2 | | £1.07/MWh indexed | |
| United States | m$135-m$135.1 latest | 3$/acre | 2% of revenue assuming roughly average price | |
| Netherlands | | Target capacity * % of area within 12nm * 650€ | Target capacity * % of area within 12nm * 3920€/MW | Target capacity * % of area within 12nm * 650€ |

# Overview

Netherlands

a) The knowledge and experience of the parties involved

b) The quality of the design of the wind farm

c) The capacity of the wind farm

d) The social costs

e) The quality of the inventory and analysis of the risks

f) The quality of the measures to assure Cost Efficiency