Stranded by Carbon Risk

Prof.dr. Dirk Brounen
Tilburg University
We all know about:

• Climate change
• Real estate’s CO2 emissions
• Paris, COP21
Lost in translation

We all know about:
• Climate change
• Real estate’s CO2 emissions
• Paris, COP21

But what does it mean?
• To you
• Today
Climate policy implications

COP21 means:
• 40% lower gHg emissions by 2030
• 80% lower gHg emissions by 2050

Enforcement in this *data transparent* era comes in various shapes and forms:
- Tax penalties
- Bans on rent

Climate risk will affect your property values

→ create an additional source of **stranded asset risk**
The Carbon Risk Real Estate Monitor
1. We translate long-term policies into clear science based targets

Global -> National
National -> Real estate industry
Real estate industry -> Sectors
The Carbon Risk Real Estate Monitor

1. We **translate** long-term policies into clear science based targets
   - Global -> National
   - National -> Real estate industry
   - Real estate industry -> Sectors

2. **Position you** into the most relevant policy pathway
The Carbon Risk Real Estate Monitor

1. **Translate** long-term policies into clear science based targets
   - Global -> National
   - National -> Real estate industry
   - Real estate industry -> Sectors

2. **Position you** into the most relevant policy pathway

3. Determine your **time to** carbon stranded asset risk exposure

![Diagram showing carbon stranded asset risk with gHg intensity and years 2027, 2030, 2050]
The Carbon Risk Real Estate Monitor

1. We translate long-term policies into clear science based targets
   - Global -> National
   - National -> Real estate industry
   - Real estate industry -> Sectors

2. Position you into the most relevant policy pathway

3. Determine your time to carbon stranded asset risk exposure

4. Help you consider steps to reduce your stranded carbon risk exposure
The CRREM tool | getting started

Core Fund 101

Load data
- Upload from Excel or API

Add certification data
- Use the CRREM certification tool

Review data
- Receive errors and warnings

Update assessment
- Type data to portfolio

Search assets
- Upload assets in Excel
- Export Data to Excel

Download the latest exported Excel file

Please click here to learn how to avoid duplicate assets.

Displaying all 3 assets:

<table>
<thead>
<tr>
<th>BUILDING</th>
<th>ENERGY</th>
<th>GHG</th>
<th>WATER</th>
<th>WASTE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Laredo, Argentina</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Missing Property Type</td>
</tr>
<tr>
<td>Unnamed Flow 33B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Missing Property Type</td>
</tr>
</tbody>
</table>

Add Asset
The CRREM tool | asset stranding diagram

STRANDING DIAGRAM (Asset #1 - Steinbach Tower)

Year of stranding: 2033
Type of use: Office
Country: Austria
The CRREM tool | retrofit simulation

Carbon intensity - Stranding diagram with (solid) and without (dashed) retrofit measures (Asset #1 - Steinbach Tower)

- Excess emissions
- Decarbonisation target
- Carbon intensity without retrofit
- Stranding without retrofit

2018 Performance

Carbon intensity after retrofitting

Stranding after retrofit

<table>
<thead>
<tr>
<th>Stranding year</th>
<th>Without retrofit</th>
<th>After retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2033</td>
<td></td>
<td>2042</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Present (negative) value of excess emissions</th>
<th>Without retrofit</th>
<th>With retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>60,233 €</td>
<td>-</td>
<td>- 21,266 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Present value of emissions below target</th>
<th>Without retrofit</th>
<th>With retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>31,488 €</td>
<td></td>
<td>72,013 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sum</th>
<th>-</th>
<th>50,747 €</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Present value of energy savings (-2050)</th>
<th>964,073 €</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net present investment costs</td>
<td>-317,006 €</td>
</tr>
<tr>
<td>Sum</td>
<td>647,067 €</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carbon Value at Risk</th>
<th>Without retrofit</th>
<th>With retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.44%</td>
<td></td>
<td>-2.54%</td>
</tr>
</tbody>
</table>

Set discount rate: 2%

Potential value premium assuming a 70% capitalisation of cost savings: 674,851 € (32.74% of GAV)
The CRREM tool | portfolio analysis

Share of carbon stranded assets

- Stranded
- Non-stranded
- Stranded
The CRREM tool | sector analysis
The Carbon Risk Real Estate Monitor

1. Helps you to identify the carbon policy measures, most relevant to you

2. Will quantify your exposure to carbon stranded asset risk

3. Helps you time retrofits, and align these with future policy implications
My Oprah moment

All of you can use the CRREM tool, for free

One more thing...

Your investors will also be using the CRREM tool for free

www.crrem.eu