



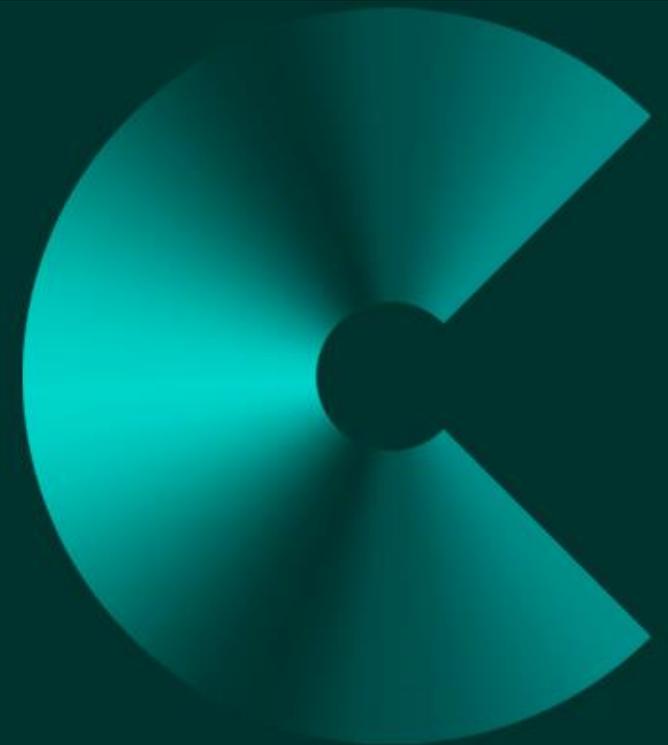
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Towards a climate transition risk assessment tool

24 AUGUST 2022



C Change webinar

Towards a climate transition risk assessment tool

Introductions

Lisette van Doorn
Chief Executive Officer, Europe,
Urban Land Institute



C Change webinar: Towards a climate transition risk assessment tool

Presenter

Kate Wolfenden
Co-founder,
103 Climate Action Consultancy





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ULI - C CHANGE PROGRAMME
INTEGRATING TRANSITION RISKS INTO
INVESTMENT DECISION MAKING –
WEBINAR

23RD AUGUST 2022

PROGRAMME REMINDER



WHAT DOES SUCCESS LOOK LIKE?

Success for this programme is focused on 2 key objectives:

1. Support ULI members and the industry to faster achieve sector-wide decarbonisation of the built environment in Europe
2. Support ULI members and the industry to better navigate, prioritise and coordinate existing initiatives and programmes for greater efficiency and impact

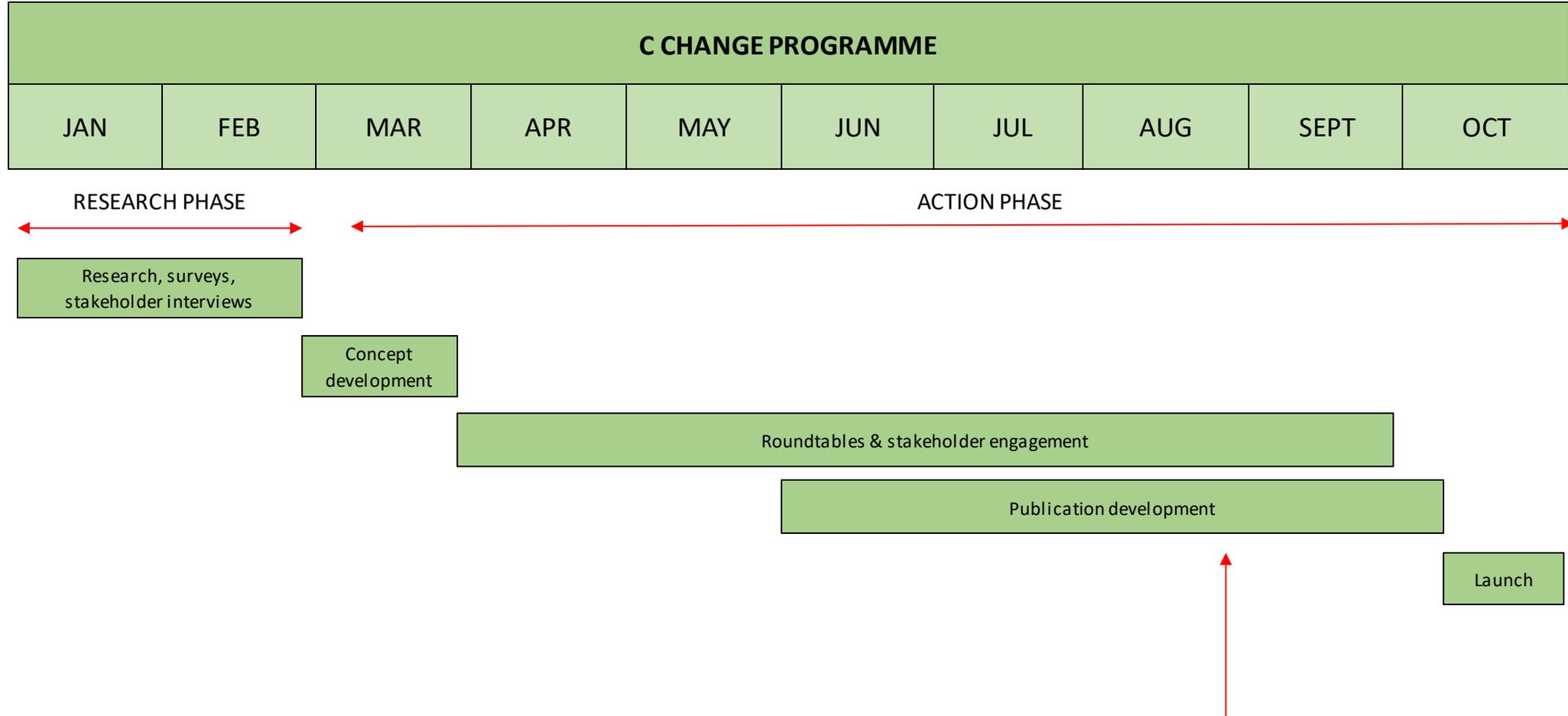
Key outputs of this programme will be:

1. A clear set of prioritised interventions to accelerate sector-wide decarbonisation in the built environment, including tangible progress against one or two of them in the course of this programme
2. A publication summarising the key interventions required and progress against them to help the sector better navigate and prioritise its actions
3. (TBC) A multi-stakeholder coordination/coalition to drive the prioritised interventions forward

At the Steering Committee on the 2nd March, the following interventions were selected:

- 1. Pricing transition risks** into property valuations
- 2. Co-developing new financial proposals/solutions** for e.g., the stranded assets challenge and other city-wide multi-benefit solutions
- 3. Coordinated investment** (owner and manager) **voice** for policy advocacy
4. Alignment to increase **occupier & tenant demand solutions** for renovations/green buildings

WHERE ARE WE NOW: TIMELINE



PRICING TRANSITION RISKS



Key objective: *To enable greater quantification and integration of transition risks into property values*

Expected outputs: A spreadsheet based tool to help investment decision makers integrate transition risks
Accompanying guidelines to help assist the investment decisions in integrating transition risks, using this tool or their own.

PRICING TRANSITION RISKS - TIMELINE

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- **Workshop 1: ULI General Membership** Mapping the investment life cycle and current climate risk approaches **May**
- **121s: Specialists** Identifying current risk integration, key financial metrics, and specific transition risks which can be quantifiable **May/June**
- **Workshop 2: ULI Technical Panel** Presenting initial assessment of quantifiable transition risks, testing assumptions and suggested support tools, exploring integrating risks into most important financial metrics **July**
- **121s: Specialists** Refinement of quantification and additional research requests e.g. banking and insurance angles. **July/ Aug**
- **Workshop 3: ULI Technical Panel** Presenting example methodology and practical examples and receive feedback; Refine **Sept**
- **ULI Councils, ULI's Call For Participation & wider sustainability movement** Presenting example methodology and practical examples and receive feedback; Refine **Sept**
- **ULI Investment Group** Draft presentation of methodology and endorsements **Oct**

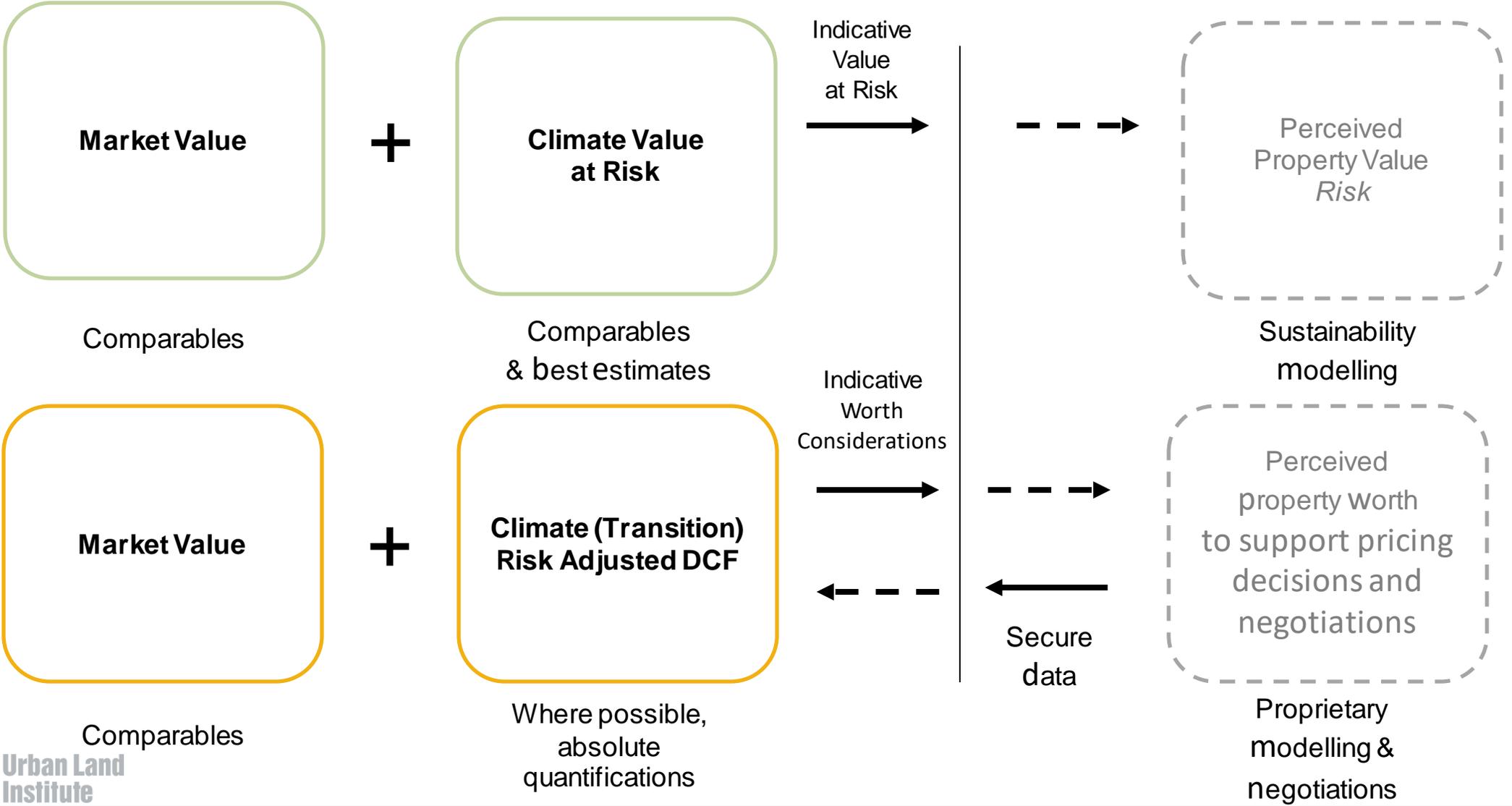
- **Four forms of climate risk info:** Strategic advice from a valuer, a prop tech service, internal sustainability capacity, or wider industry intelligence
- **Climate risk:** Proxy term for physical risk
- **Transition risk:** Either too abstract (e.g. long time horizons of regulatory impacts) or in underwriting (e.g. decarbonisation assessments)
- **Standards industry :** RICS, Jan 2022, Tegova Dec 2020 and new Technical Advisory for update
- **Methods:** RICS leading the charge for discounted cash flow analyses and the income or cost approach
- **Leading valuation industry players:** Developing green premium and brown discount estimates based on specific asset classes and locations.
- **Further valuation players:** aggregating large institutional investor data sets and developing sensitivity analyses
- **Several new valuation initiatives:** Including RICS European Leaders Forum on ESG & Valuation and INREV's ESG Seminar. Strong and necessary focus on Comparables.
- **Our aim:** Listen and respond to industry need

- **Climate risks are impacting investment decisions in three ways across the lifecycle of a property asset - strategy, decision and price.**
 - **Strategy.** e.g. Reputational risk of SFDR rollback. Qualitative, but higher impact: Resulting in an entire strategy change
 - **Decision.** e.g. Physical risk of catastrophic flood plain. Qualitative & Quantitative. Medium impact: Resulting in a go-no go decision
 - **Price.** e.g. Transition. Cost of decarbonisation. Medium impact: Resulting in a price adjustment.

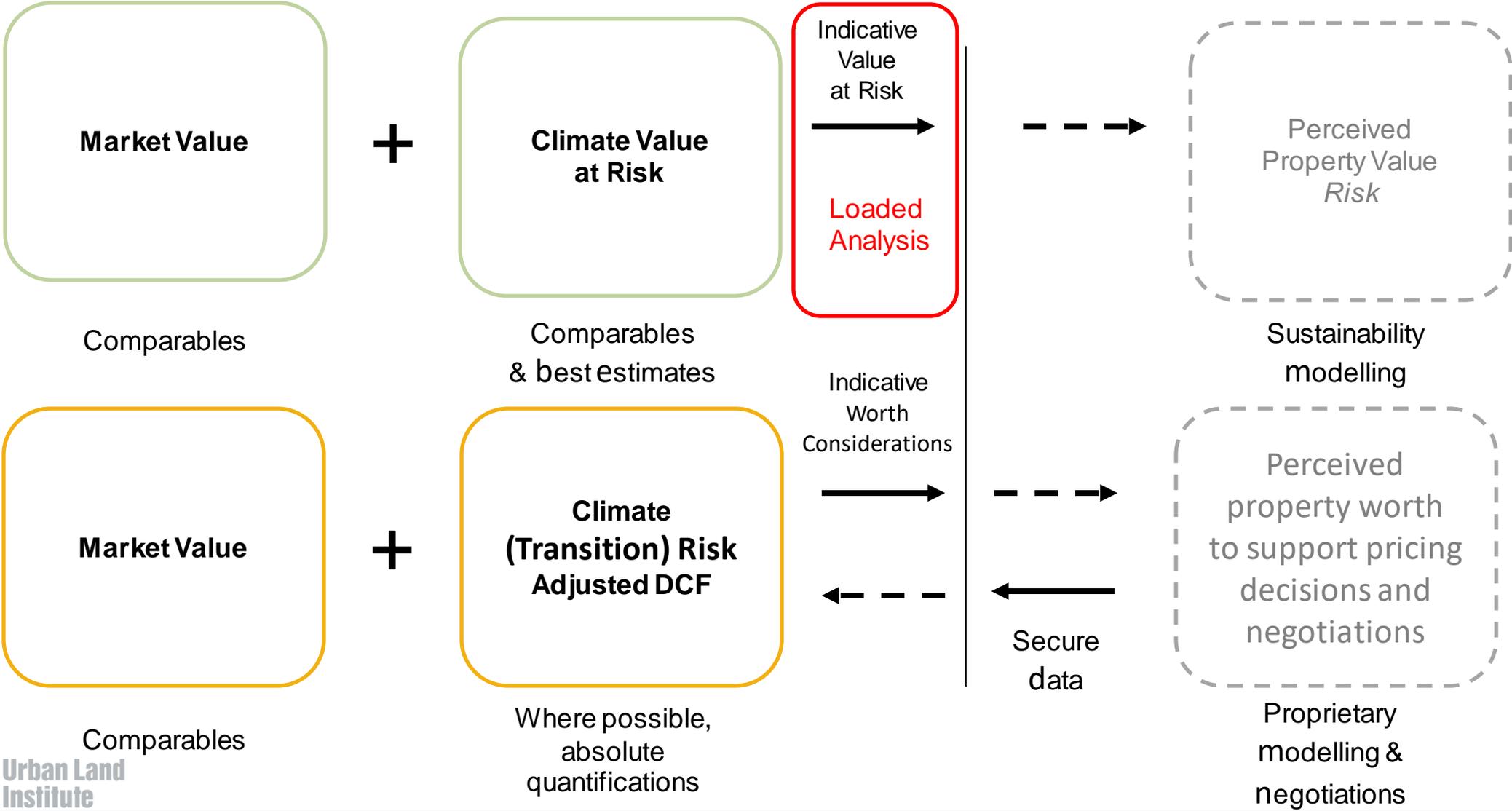
	INVESTMENT THESIS	INVESTMENT COMMITTEE 1	INVESTMENT COMMITTEE 2	GOING CONCERNS	SALE/ DIVESTMENT
INVESTMENT STRATEGY	REPUTATIONAL - QUAL PHYSICAL - QUAL/ QUANT TRANSITION - QUAL	REPUTATIONAL - QUAL PHYSICAL - QUAL/ QUANT			
INVESTMENT DECISION		PHYSICAL - QUAL/ QUANT	PHYSICAL - QUANT TRANSITION - QUAL/ QUANT	PHYSICAL - QUAL/ QUANT TRANSITION - QUAL QUANT	PHYSICAL - QUAL/ QUANT TRANSITION - QUAL QUANT
INVESTMENT PRICE			TRANSITION - QUANT	PHYSICAL - QUAL/ QUANT TRANSITION - QUAL QUANT	PHYSICAL - QUAL/ QUANT TRANSITION - QUAL QUANT

- **This programme is honing down specifically on transition risks, and furthermore on to risks which can be translated into costs to inform the investment price and decision.** Through evidence of successful investment price adjustment and decision making, we hope to inform strategy.

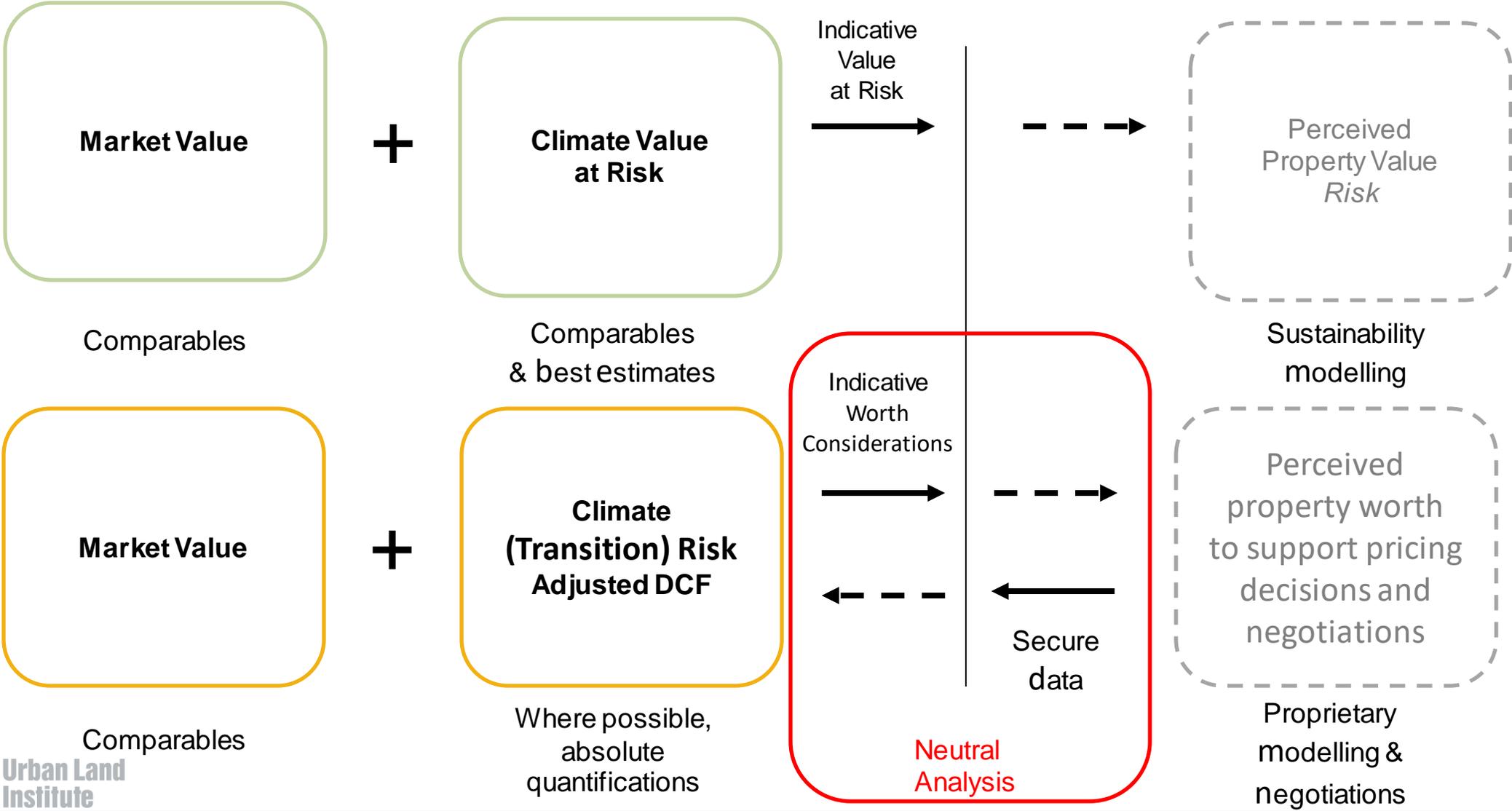
PRICING TRANSITION RISKS - KEY FINDINGS



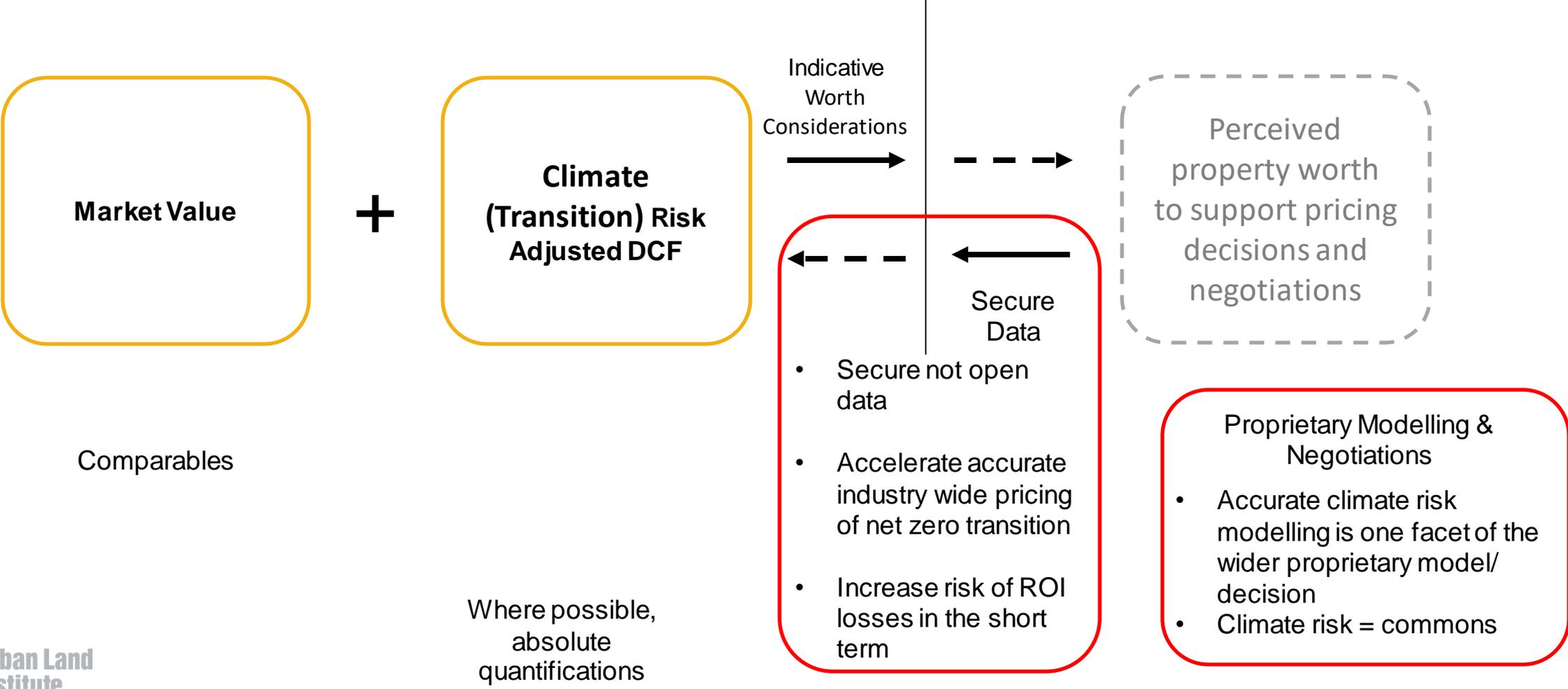
PRICING TRANSITION RISKS - KEY FINDINGS



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PRICING TRANSITION RISKS - KEY FINDINGS



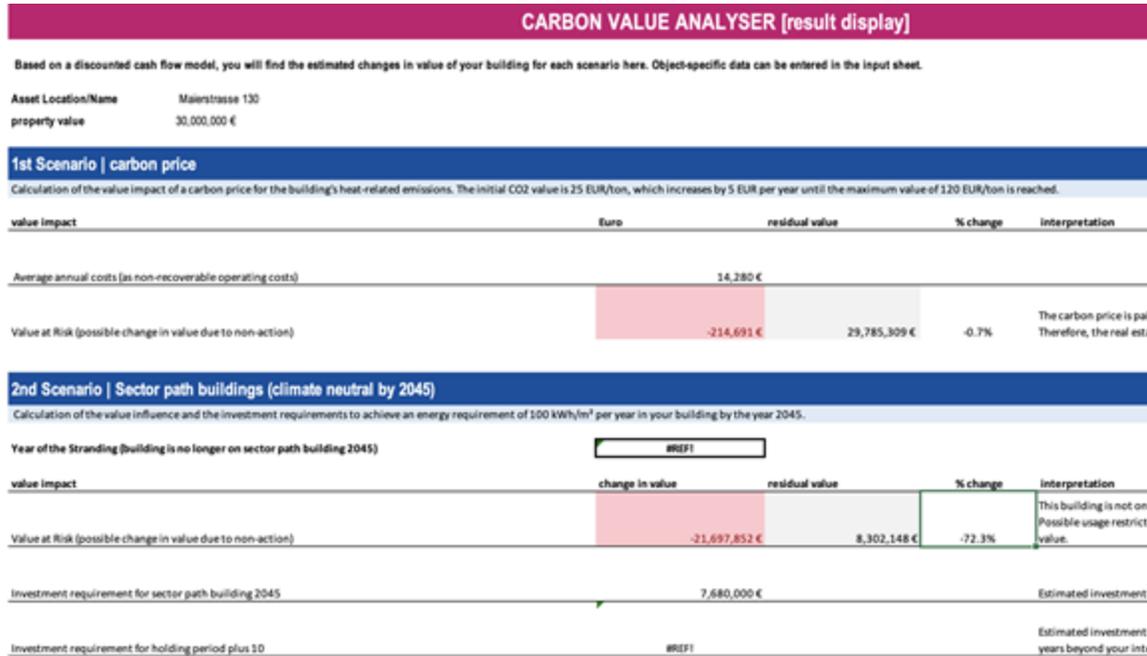
PRICING TRANSITION RISKS - KEY FINDINGS

- The transition risks we see are falling into 4 categories of transferability into investment decisions, and contribute to 2 arguments for action:

	1. IMMEDIATELY TRANSFERRABLE	2. TRANSFERABLE WITH ASSUMPTIONS	3. NOT POSSIBLE WITHOUT SENSITIVITY ANALYSIS (?)	4. CURRENTLY NOT MATERIAL, BUT NEEDS WATCHING
1. COST OF ACTION	<ul style="list-style-type: none"> • DECARBONISATION COST NOW • INTERNAL RESOURCING COST • EXPECTED TENANT VOIDS 	<ul style="list-style-type: none"> • DECARBONISATION COSTS - FUTURE • RESOURCE COSTS - FUTURE 		<ul style="list-style-type: none"> • FINANCING TERMS
2. COST OF INACTION	<ul style="list-style-type: none"> • ENERGY SAVINGS - NOW 	<ul style="list-style-type: none"> • VOLUNTARY CARBON PRICE • INFLATION (INCLUDING RESOURCE COSTS, DECARB COSTS, ENERGY PRICE ETC) • TENANT QUALITY/ YIELD • OBSOLESCENCE 	<ul style="list-style-type: none"> • REGULATORY IMPACTS • CHANGE IN AGGREGATE TENANT PREFERENCE • BUILDING STANDARDS RELATED PREMIUM 	<ul style="list-style-type: none"> • FINANCING TERMS • CARBON PRICE

PRICING TRANSITION RISKS - KEY FINDINGS

- Building on existing expertise and solutions, with a partnership-based approach...



	Without retrofit	After retrofit
Stranding year	2046	1.5°C-ready
Present (negative) value of excess emissions	- 5,798 €	- €
Present value of emissions below target	283,600 €	322,252 €
Sum	277,802 €	322,252 €
Present value of energy savings (-2050)	485,830 €	
Net present investment costs	- 197,933 €	
Sum	287,897 €	
Carbon Value at Risk	-13.89%	-16.11%
Set discount rate:	2%	
Potential value premium assuming a 70% capitalisation of cost savings:		340,081 € (17% of GAV)

PARAI

[Go to 1](#)

- Build on the absolute-ness of data
- Interesting methods e.g. calc of economic obsolescence through minimum standards income cliff edge
- Climate value at risk pricing

- Build on the excellent data sets – e.g., emissions, cost of energy
- Work into retrofit and cost of carbon estimates for greater nuance
- Include extra financial metrics e.g. NOI, Cap rate, Exit Cap Rate
- Climate value at risk pricing

The full technical scope of the solution is in development. However, we can confirm some key foundational elements to a solution:

- Uses Discounted Cash Flow Model in .xls and integrates transition risks with relative assumptions into back up sheets
- Does not seek to generate own quantitative assessments for assumptions, instead seeks partners and/pr data providers (e.g. CRREM, Madaster, CBRE, Arup etc) or data sharing to reduce duplication and enable delivery within resource constraints
- Assumes whole building emissions responsibility
- Assumes embodied carbon emissions historic as an asset and retrofit measures as a new cost
- Uses a commonly agreed cost of carbon to calculate risk, which can be adapted

PROGRESS ON THE TOOL SO FAR



WHY THIS TOOL IS IMPORTANT

- At present there is **no standardised way for the industry to look at transition risks**
- Until there is a method, transition risks will **fail to be integrated into investment decisions** (evaluation of work and ultimately pricing negotiations and decisions)
- The **valuation service provider industry is doing great work observing and quantifying the market** on available data, but we need more standardised comparables to work from
- This tool will work investment industry side to **standardise the process of integrating transition risks into an industry standard DCF**
- If achieved, this tool will help the industry be better informed, but:
 - **Not how the market will value** and ultimately accept as the price of an asset
 - Instead it will **focus on what the industry needs to know in terms of quantified costs and financial benefits, so that it can inform their assessment of worth and ultimate price negotiation.**
- Should a standardised method be accepted, this creates significant opportunity for new brown to green markets opening up to support otherwise potential stranded assets, greater accountability between transacting entities to disclose costs/ risks, greater potential for faster decarbonisation of building stock.

What: Climate (Transition) Risk Adjusted Value (CRAV) Calculator

Tone:

- Neutral. Not here to create a case for decarbonisation; Here to present the facts
- Realistic. Some risks may not be accurately priced, but best guide can work as an indicator as aggregate data and policy updates get's us closer. The practice is important, increased accuracy will come in time.
- Long term view. Some risks may not be material yet, but if the practice is created, they can continue to be integrated in the long term.

Format:

- Spreadsheet - Discount Cash Flow Analysis
- Base Industry Standard DCF
- Climate Risk Adjustments DCF
- DCF Inputs: Discount Rate, WACC, Capex,
- DCF Reporting Metrics: NOI, Cap Rate, Exit Cap Rate, IRR/ NPV, FCF

DCF STYLE, INDUSTRY STANDARD FORMAT

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CLIMATE ADJUSTED MARKET VALUE CALCULATOR		Inputs	Actions
ASSET DETAILS			
Name			
Location			
Floorspace (sqm)			
Total Energy usage (per type)			
Cost of Energy (per type)			
Total Emissions (per type) KG co2e / py			
Total Emissions Intensity (per type) KG co2e / psqm			
Holding period			
Gross Asset Value (Fair market value)	From Valuer		
Expected Exit Yield	Self entry or GAV * Growth rate		
Discount Rate	Risk Free Rate & Risk Premium (Premium Driv		
STANDARD ACCOUNTING			
INCOME			
Estimated Rental Income per month			
Plus Other collectables (e.g. Service charge)			
Less Expected Vacancy (% of income)			
Less Credit Losses			
OPERATING EXPENSES			
Property Tax			
Insurance			
Common Areas Maintenance			
Property Management Fees			
Utilities (by type)	Types linked to costs, data from CRREM		
NET OPERATING INCOME			
CAPEX			
Property Upgrades			
Depreciation (Physical Deteoriation & Functional Obsolescence) & Amortisation			
Income Tax			
Cost of Debt	Self entry - not sure where to place/ how to pre		
FREE CASH FLOWS			
CAP RATE	Inherent in DCF		
EXIT CAP RATE	YR 1NOI*GAV		
	YR x NOI* GAV		
CLIMATE ADJUSTED ACCOUNTING			
CLIMATE ADJUSTED ACCOUNTING			
		Embodied emissions (kG co2e)	Self entry or default - Madaster (+ DRPT additions)
		Cost of embodied carbon	Self entry or default from B35 *Carbon Price* Growth Rate
		Expected stranding date Paris Pathways	Driven from CRREM
		Expected stranding date Local Policy (Minimum Standards)	Driven from a policy tracker
		Expected Exit Yield	Self entry or GAV * Growth Rate *Rental income increase
INCOME			
		Estimated Rental Income per month increase	TBC DENEFF based on energy cost reduction driver, aggregate studies
		Other collectables increase/ reduction	To discuss with DENEFF
		Plus grid contribution	Self entry or default
		Less expected vacancy increase/ decrease	Driven from DRPT
		Less credit losses increase/ decrease	TBC driver
OPERATING EXPENSES			
		Property Tax Increase/ Reduction	TBC
		Insurance increase/ Reduction	Nominal in transition
		Utilities (By type) Increase./ Reduction	Driven from CRREM assumptions
		Carbon cost (Voluntary, and/or local policy linked)	Driven from policy tracker or to be developed with ULI* carbon price * growth rate
NET OPERATING INCOME			
Capex			
		Decarbonisation Event 1	Driven from DRPT* growth rate (Price Indices)
		Decarbonisation Event 2	Driven from DRPT* growth rate (Price Indices)
		Decarbonisation Event 3	Driven from DRPT* growth rate (Price Indices)
		Decarbonisation Event 4	Driven from DRPT* growth rate (Price Indices)
		Depreciation (Physical Deteoriation & Functional Obsolescence) & Amortisation	TBA driven from DRPT Technological Depreciation
		Income Tax	



UNDERPINNED BY DATA PARTNERS

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CLIMATE ADJUSTED ACCOUNTING	
Embodied emissions (kG co2e)	Self entry or default - Madaster (+ DRPT additions)
Cost of embodied carbon	Self entry or default from B35 *Carbon Price* Growth Rate
Expected stranding date Paris Pathways	Driven from CRREM
Expected stranding date Local Policy (Minimum Standards)	Driven from a policy tracker
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OPERATING EXPENSES	
Property Tax Increase/ Reduction	TBC
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Capex	
Decarbonisation Event 1	Driven from DRPT* growth rate (Price Indices)
Decarbonisation Event 2	Driven from DRPT* growth rate (Price Indices)
Decarbonisation Event 3	Driven from DRPT* growth rate (Price Indices)
Decarbonisation Event 4	Driven from DRPT* growth rate (Price Indices)
Depreciation (Physical Deteoriation & Functional Obsolescence) & Amortisation	TBA driven from DRPT Technological Depreciation
Income Tax	



1. Price Impacts

- Decarbonisation Range Price Tool
- Cost of Carbon
- Embodied Carbon
- Estimated Vacancies
- Estimated Rental Income – increase and decrease
- Operating Expenses
- Technological Depreciation
- Obsolescence – functional and economic (policy tracker)
- Amortisation



2. Financial Metrics

- Inputs: Discount Rate, WACC, Capex
- Outputs: NOI, Cap Rate, Exit Cap Rate, NPV, IRR, Growth Rate



3. Format & Tone



1. Decarbonisation range price tool modelling (Higher spec suggestion)

Discussion: region versus city, decarbonisation solutions versus case studies, average price for sqm or more granular

- List of decarbonisation solutions will be costed by Arup cost consultant teams detailing difference in costs country by country
- All countries in Europe will be attributed to a climatic zone
- Company will be able to enter vital criteria into DCF (e.g. country, building typology, square f/m, etc)
- Model draws from CRREM data to give average emissions intensity per square f/m, or they can self enter
- Model draws from Arup decarb data to identify the climatic zone the country is in
- Model draws from CRREM data to identify emissions reduction pathway requirement and where this asset sits in relation to that
- Model will then presents optimum emissions reduction activities for this specific building typology, in the specific country – it will display costs, expected emissions reductions, and associated embodied carbon emissions of new retrofit items
- Company can then manually choose to select more, less or different interventions from the library of decarbonization solutions and observe how that impacts their costs and emissions reductions costs.
- The model is linked to the energy costs of CRREM so it also gives them energy saving costs in the analysis
- The model automatically takes this assessment and plugs it into the DCF in the appropriate capex and opex budget lines

2. Cost of Carbon

- *Discussion: Inclusion, linking to an agreed benchmark, understanding not currently a big lever but will be*
- Will be covered in guidelines – whole building responsibility, 3 tiers given
- Calculation - Tracking an e.g., EU Carbon Permits Benchmark.

3. Embodied Carbon

Discussion: Inclusion, including historic buildings and what database would be the best solution

- Covered in guidelines – Start valuing historic as an asset
- Average historic data provided by e.g., Madaster
- Average new retrofit embodied carbon emissions provided through Arup decarbonisation data

4. Expected Vacancies

Discussion: Linked to business planning, so tool must be flexible, linked to decarbonization range price tool

- Linked to Arup decarbonization data for retrofit impacts on any requirements for tenants to vacate the building

5. Estimated Rental income

- **Decrease**

Discussion: minimum standards not enough evidence yet

- Linked to minimum standards, income drop off e.g., NL EPC C & below 2023

- **Increase**

Discussion: market driven too speculative, no clear causation, also temporary – net average from CBRE 6%, option for both

- Investor Driven: Linked to necessary costs incurred for renovation (comparison against market rents, premia)
- Not linked to Market Driven

6. Operating Expenses:

Discussion: CRREM as an agreed data source, allow for investor perception of inflation versus projections, too volatile.

- Utilities Increase:

- Costs from CRREM (TBC)
- Increase linked to forecast of energy cost rise (TBC on source)
- Decrease linked to Arup Decarbonisation tool emissions reductions multiplied by CRREM costs

- Management Fees – Not affected

- Property Tax – Covered elsewhere

-  Insurance – Discussion: Not possible to integrate in the V1

7. Technological depreciation:

Discussion: not only retrofit technologies, for wider depreciation, should be handled in industry DCF

- Additional depreciation related to new retrofit technologies (ca. 10 years)

8. Obsolescence

Discussion: Where should economic obsolescence (which results in expenditure against to prevent against loss of income) it should be detailed in op ex and not here

- Functional – Discussion:
 - No including as normal functional obsolescence will be covered by standard DCF, also double counting with technological depreciation
- Economic – Discussion:
 - Included in rental income / minimum standards drop off, so not included here

9. Amortization

Discussion: Need to find out more about the timeline for banks (which we did) – also insurance (in process)

- Interest Rates/ Geared / ESG Loans - Amortization rates currently low ca. 10-20 bases points
- Availability of capital is not possible to measure for the V1 of this tool

WHAT

Discussion: What metrics are most important, any missing (growth rate)

- DISCOUNT RATE INPUT
- (WACC) INPUT
- CAPEX INPUT
- NET OPERATING INCOME OUTPUT, REPORTING METRIC
- CAP RATE OUTPUT, REPORTING METRIC
- EXIT CAP RATE OUTPUT, REPORTING METRIC
- NPV OUTPUT, REPORTING METRIC
- IRR OUTPUT, REPORTING METRIC
- GROWTH RATE OUTPUT, REPORTING METRIC

WHAT

- DISCOUNT RATE
- (WACC)
- CAPEX
- NET OPERATING INCOME
- CAP RATE
- EXIT CAP RATE
- NPV
- IRR

IMPACTED BY

RFR (bonds/secs) + **RP (typically between 3-10%)** - Typically between 7.5-9.5%?

Keep free from transition risk impact, accounted for elsewhere

$WACC = (E/V \times Re) + (D/V \times Rd \times (1 - Tc))$ – **financing availability Vs cost**

Shift to availability of capital conversation and revert to DCF impacts if possible

Cost of decarbonisation plus forecast

Directly included in DCF

Income (**Rental yield**) After operating expenses (**utilities**)

Directly included in DCF

Initial yield Yr 1 (**See NOI, Acquisition discount/ rental premium/ capex init. decarb.**)

Impacted by direct inclusions in DCF – no further assumptions required

Yield exit yr end (**See NOI**)

Impacted by direct inclusions in DCF – no further assumptions required

DR, Sum of FCFs, Exit Value (**FCFs by NOI, Exit Value by rental loss, premium**)

Impacted by direct inclusions in DCF – no further assumptions required

% return on all FCFs ...Initial Investment, FCF, Exit Value (**FCFs by NOI, initial acquisition discount/ rental premium/ capex initial, capex, Exit Value by rental loss, premium**)

Impacted by direct inclusions in DCF – no further assumptions required

DISCOUNT RATE:

- **Discount Rate Calculation**

Discussion – Risk premium too complex, too speculative. Aim – not to demystify RP but instead separate out TR from RP and explicitly include elsewhere

- Risk Free Rate (bonds/securities) + **Risk Premium (between 3-10%)** – typically between 7.5-9.5% (1)
- **Recommendation:**
 - Do not double count
 - Maintain industry estimates on risk premium
 - And instead extract transition risks into quantifiable DCF impacts

- **WACC Calculation**

Discussion: Cost of equity is speculative, cost of debt has some potential to impact and therefore must be carefully considered so not included in double counting e.g. amortisation – more research required on banking (complete)

- $WACC = (E/V \times Re) + (D/V \times Rd \times (1 - Tc))$
- $WACC = (\text{market value of equity} / \text{total market value of equity and debt} \times \text{cost of equity}) + (\text{market value of debt} / \text{total market value of equity and debt} \times \text{cost of debt} \times 1 - \text{Corporate tax rate})$
- **Recommendation:**
 - WACC is impacted by decarbonisation in some places. We *may* need to work out where is the better fit for its inclusion. E.g.,:
 - **Cost of debt** (and indeed availability of debt)
 - At present not possible to model in V1 of this tool
 - **Cost of Equity.** We propose that the premium/ discount associated with cost of equity over the DCF is market observation driven, so we do not integrate into the model. → leave function for self entry

- **CAPEX Calculation**

Discussion: role of Capex well covered before, important to keep space for non decarb capex in industry DCF

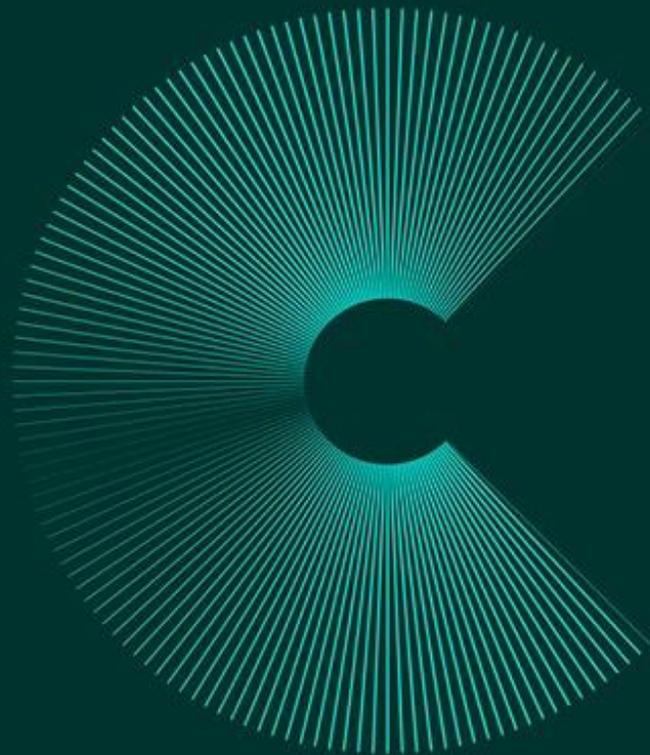
- $CapEx = \text{Property Plant \& Equipment upgrades} + \text{Current Depreciation}$
- **Recommendation:**
 - **Property, plant and equipment upgrades** are not just for decarbonisation purposes.
 - Standard DCF includes wider PPE upgrade requirements and the Climate (Transition) Risk Adjusted Value (CRAV) Section includes decarbonisation costs and associated depreciation.

- Open feedback and questions now
- Survey circulated afterwards

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THANK YOU





Mobilising the real estate industry to decarbonise.

Save the date for the C Change Summit

Van Nelle Fabriek, Rotterdam

Wednesday 12 October 2022



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We value your feedback and would appreciate if could take a minute to complete the Zoom survey.

Email any other feedback, comments or questions to Europe.events@uli.org



Thank you for attending the webinar.

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