

SUSTAINABILITY DRIVERS AND BARRIERS

MAPPING THE MOTIVES
FOR SUSTAINABLE OFFICE
DEVELOPMENT IN PRAGUE

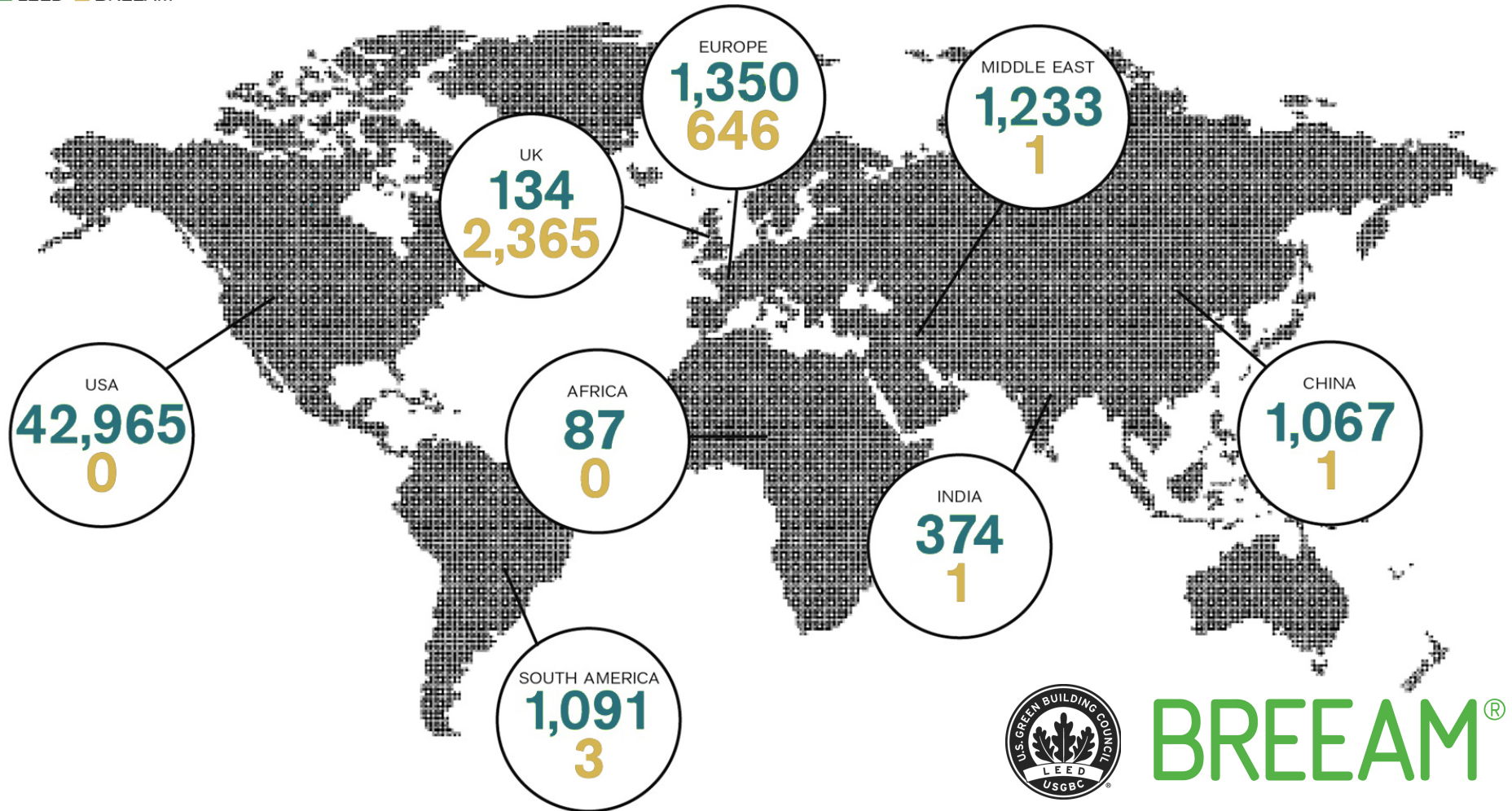
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NOVEMBER 2016

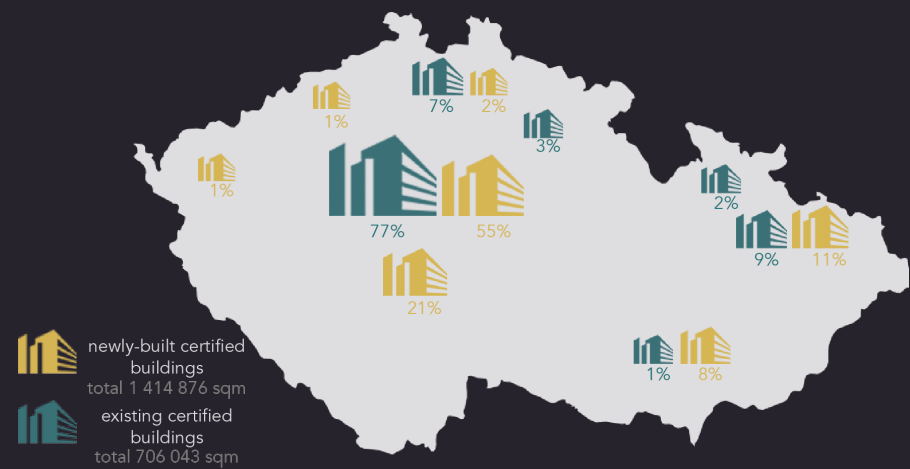
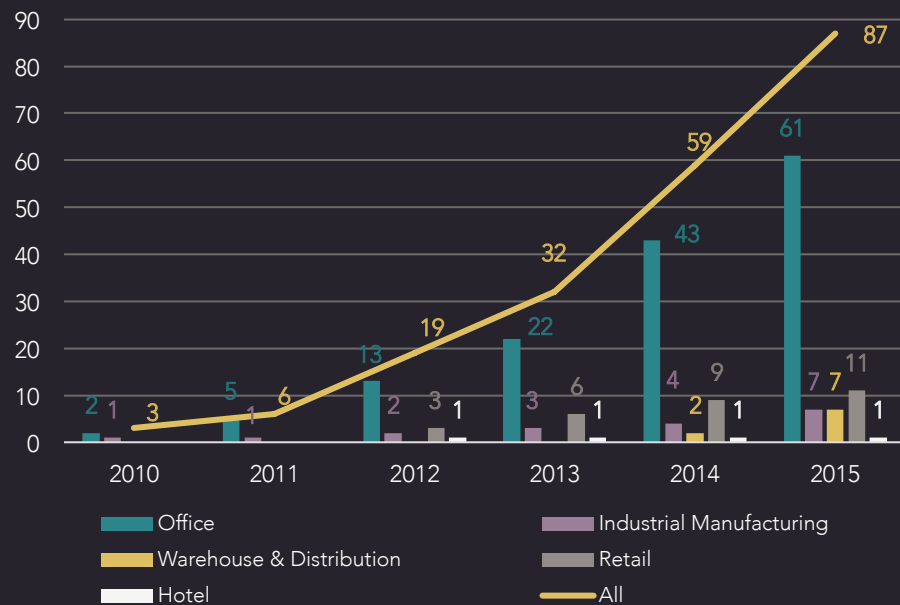
introduction

built industry

- 40% of energy consumption
- 36% of total CO₂ emissions
- water, resources, waste

■ LEED ■ BREEAM







Introduction

Relevance

Problem statement

Research questions

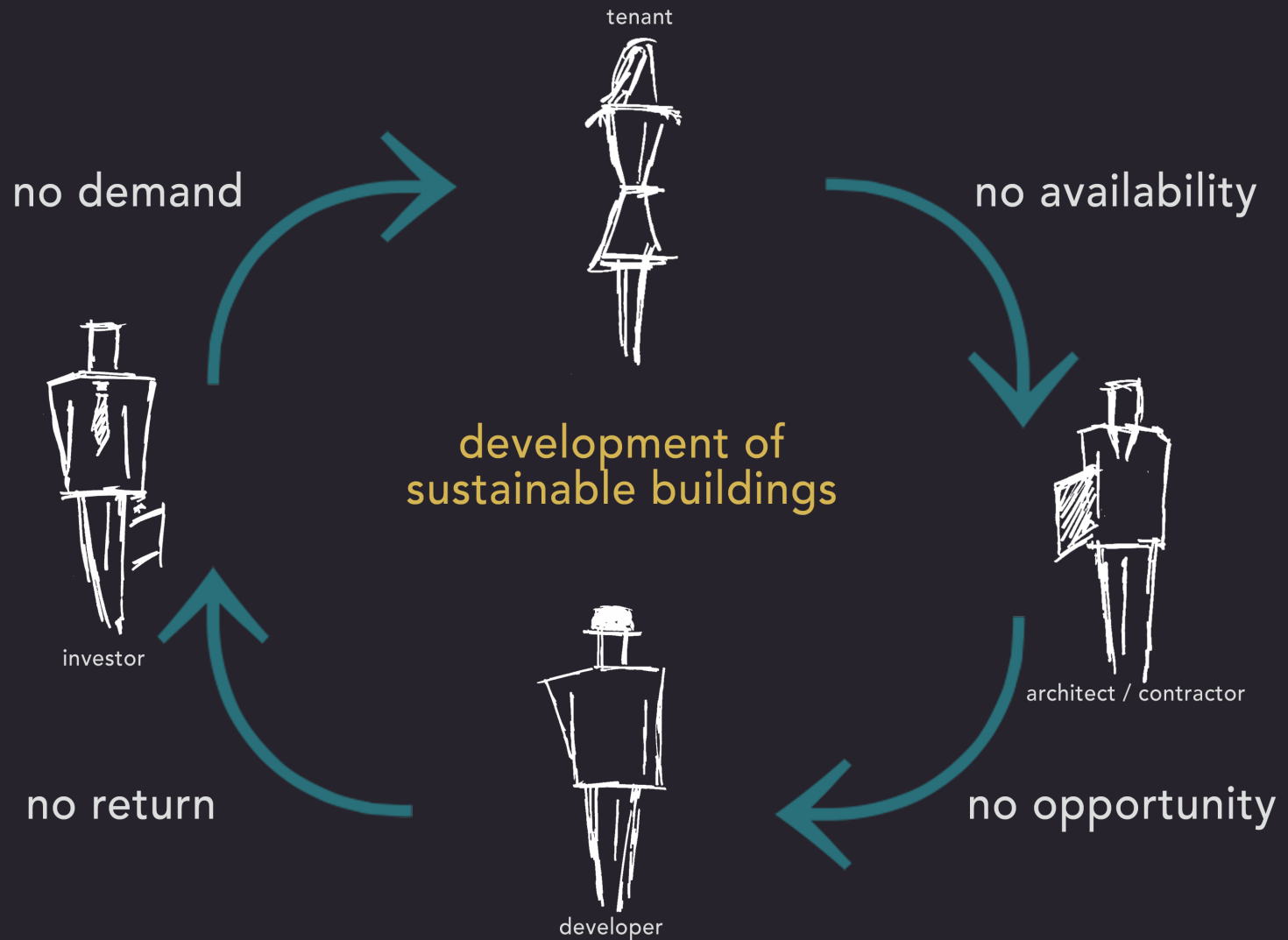
Literature

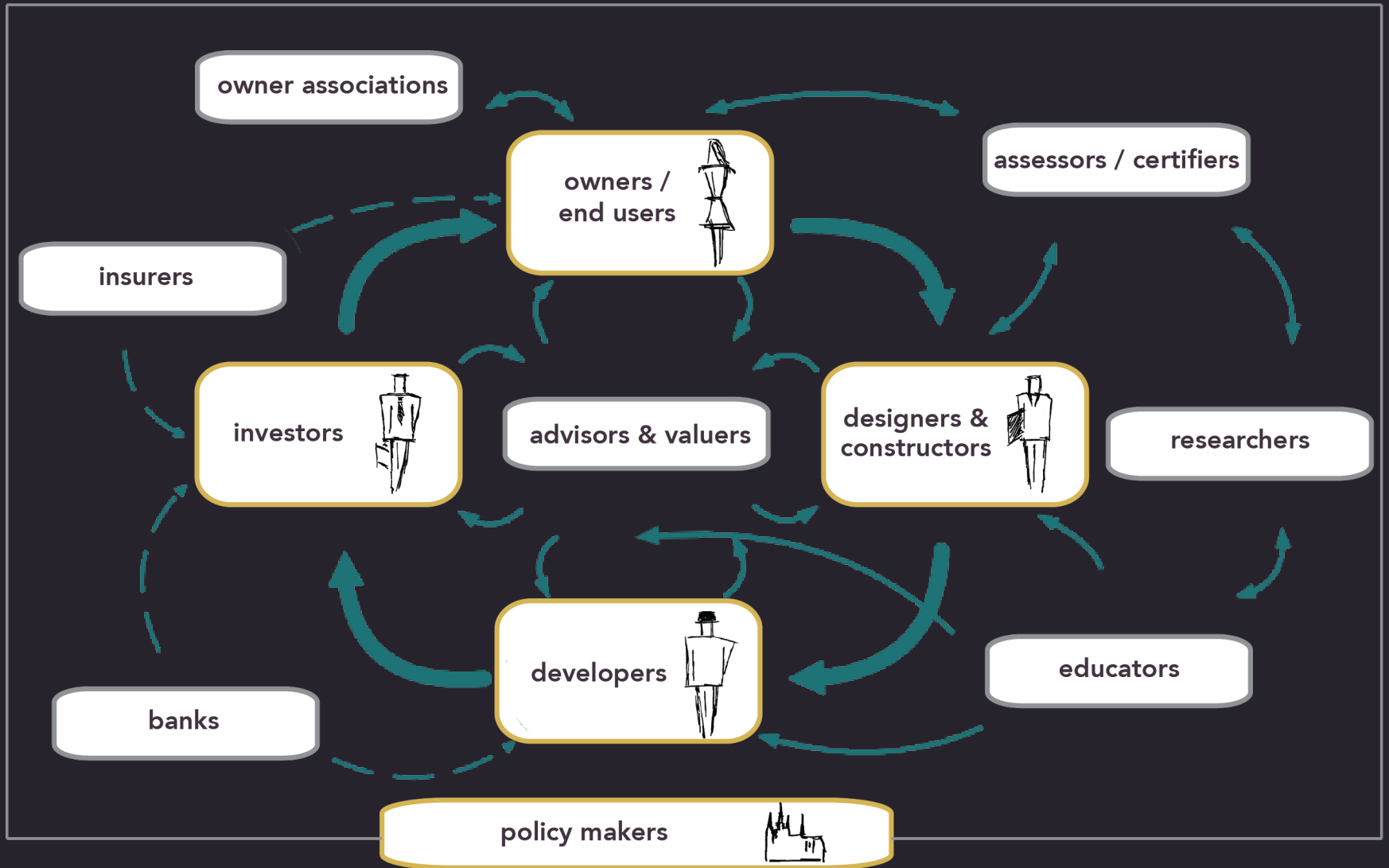
Methodology

Findings

Recommendations

problem statement





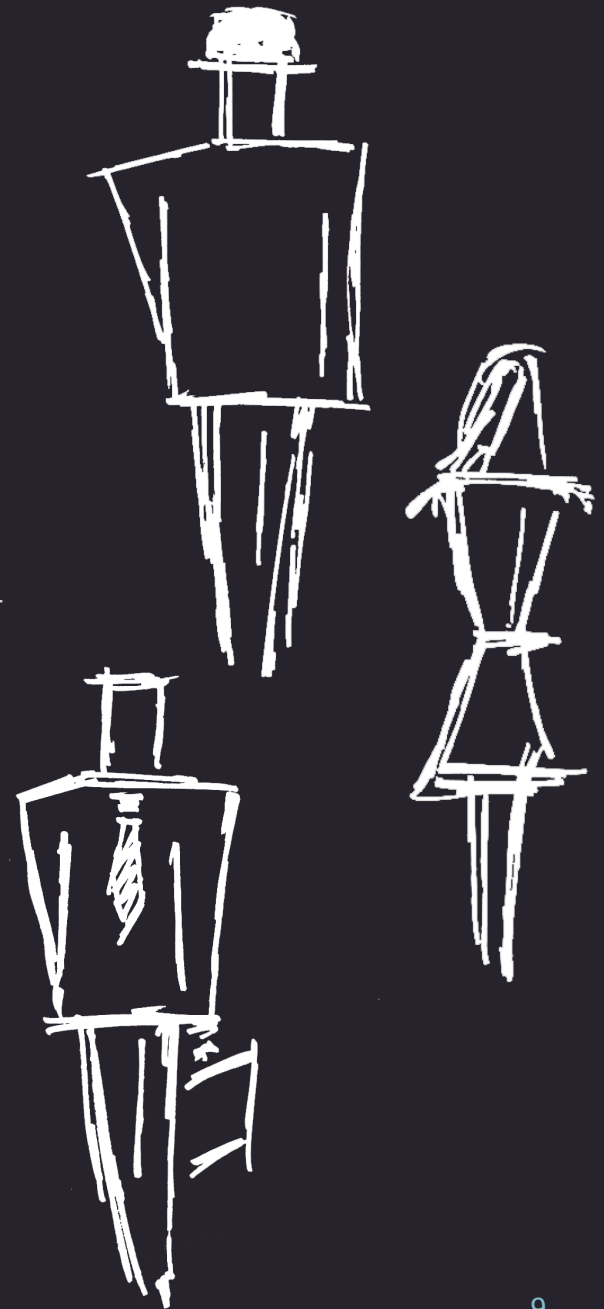
research questions

What are the **most important drivers and barriers** of the development of certified office buildings in Prague and what is the perception of buildings' sustainability of main involved stakeholders in the Prague office market?

What are the drivers and barriers for **developing** sustainable office buildings in theory and in Prague practice and how do these differ for **different levels** of green certifications?

For which reasons do office occupiers **prefer sustainable offices** in theory and in Prague practice? To what extent is office building's certification **important** for the occupiers compared to other decision-making factors?

What are the benefits and hindrances of **purchasing and owning** sustainable office buildings for investors and how are these perceived in the Prague office market? What is the difference in this perception regarding **various levels** of green certifications?



corporate social responsibility



interest in sustainability

image & marketing

knowledge of sustainability

life cycle



functional obsolescence

maintenance costs

operating costs

market value



return on investment

time on market

occupancy

rent level

asset value

selling price

exit yield

design & construction process



design & construction costs

building's quality

financing

legal obsolescence

staff wellbeing

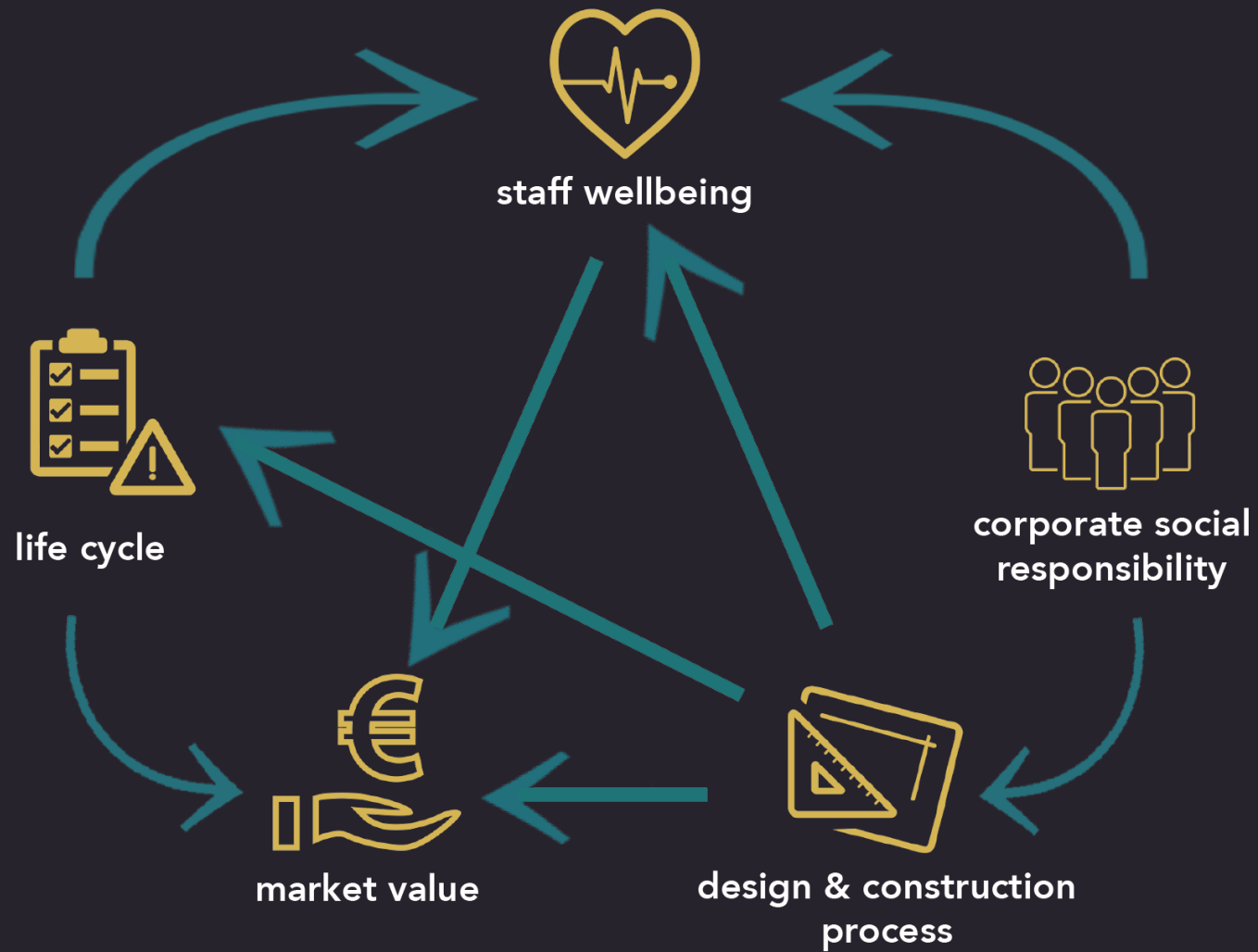


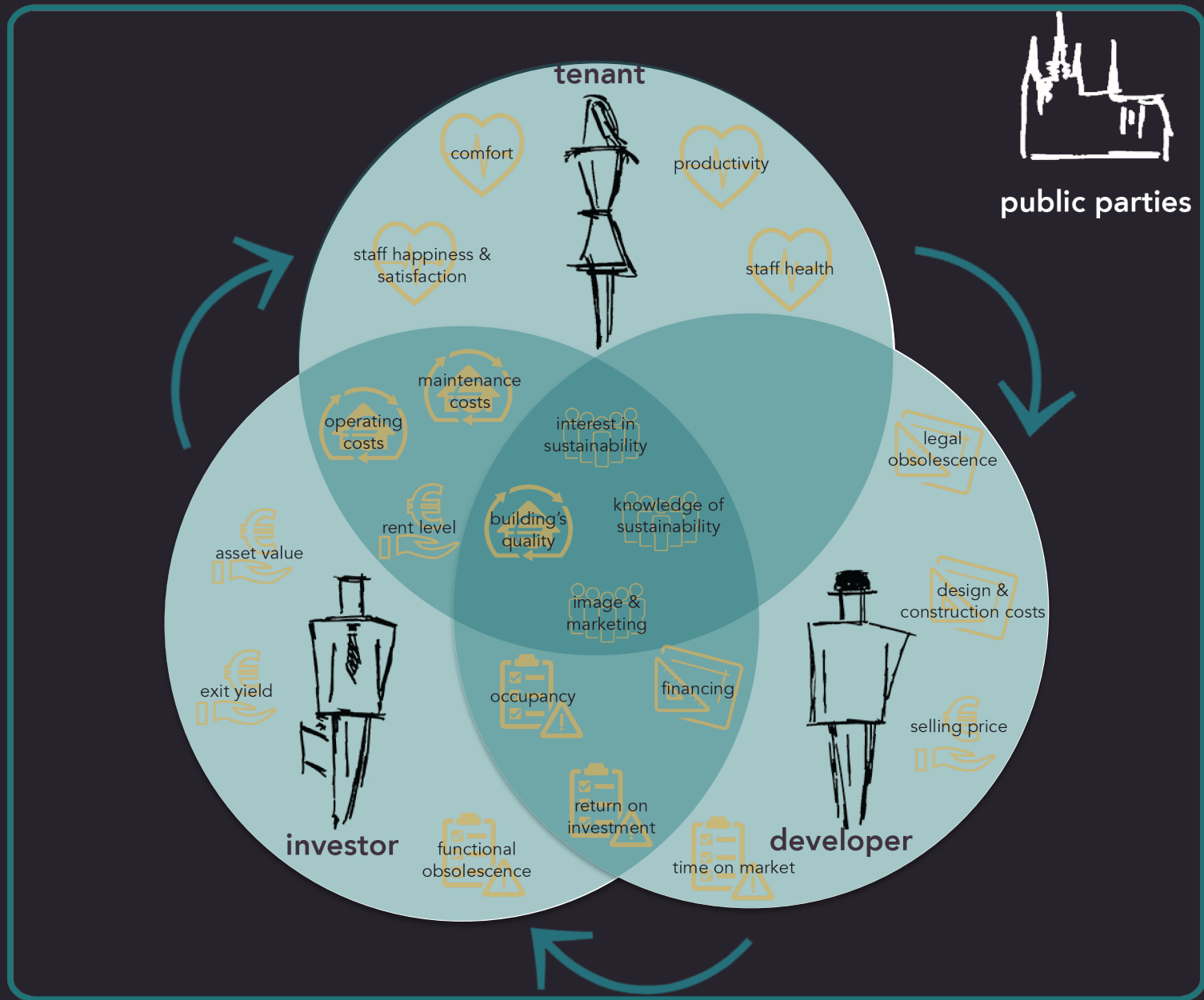
staff happiness & satisfaction

productivity

comfort

staff health







PROFIT

7th



PEOPLE

6th

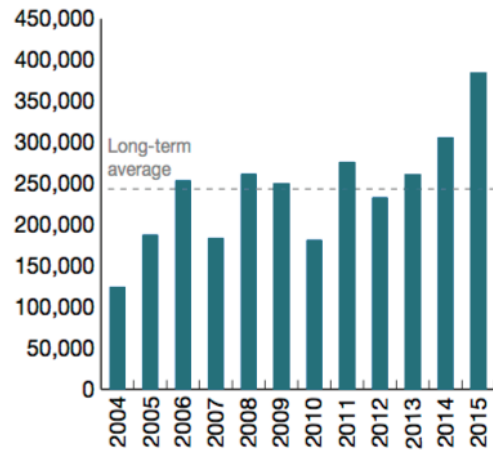


PLANET

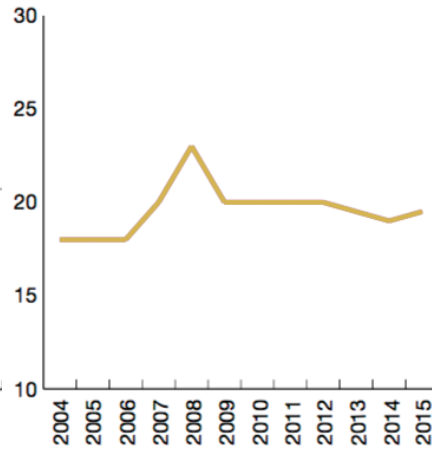
31st



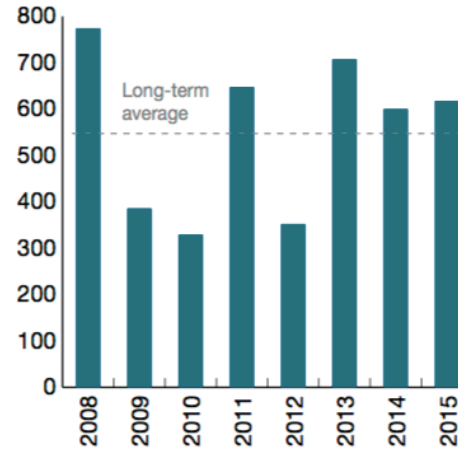
total office take-up
sqm



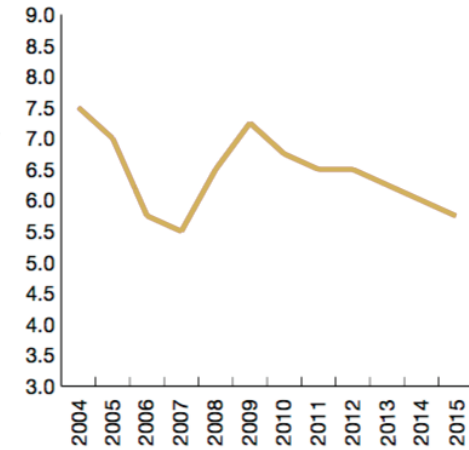
prime office rents
EUR/sqm/month

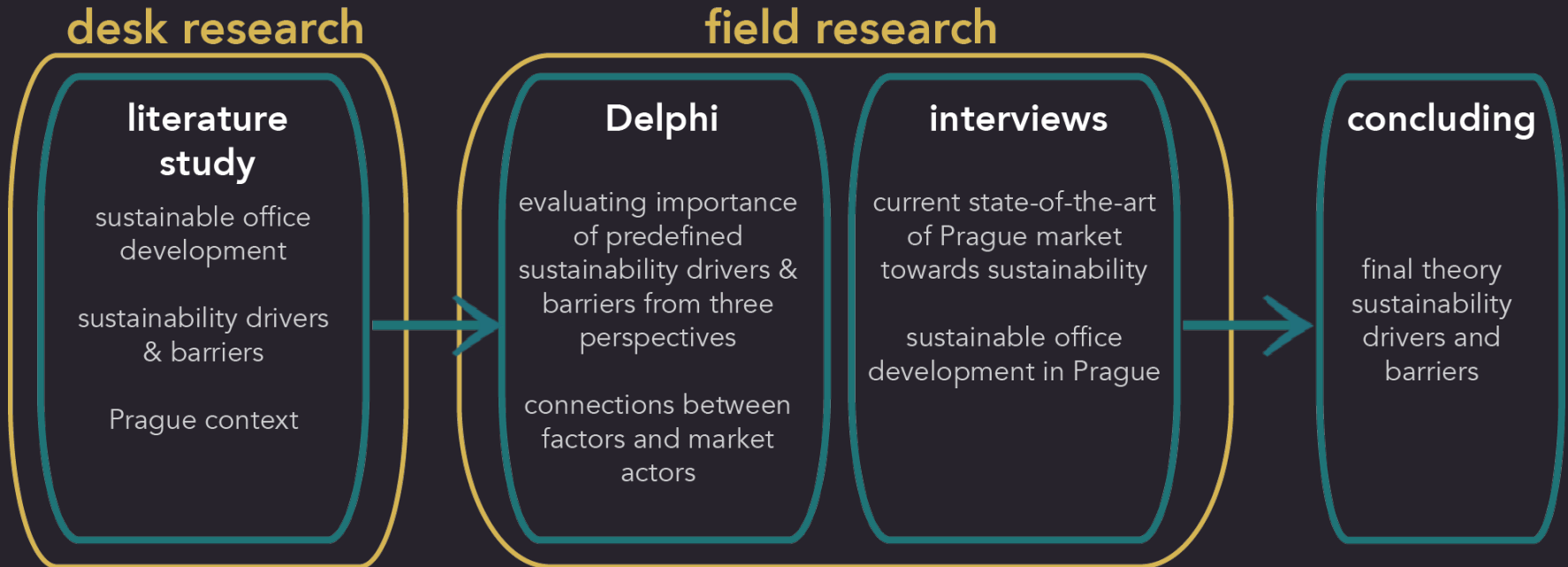


office investment volumes
mil. EUR

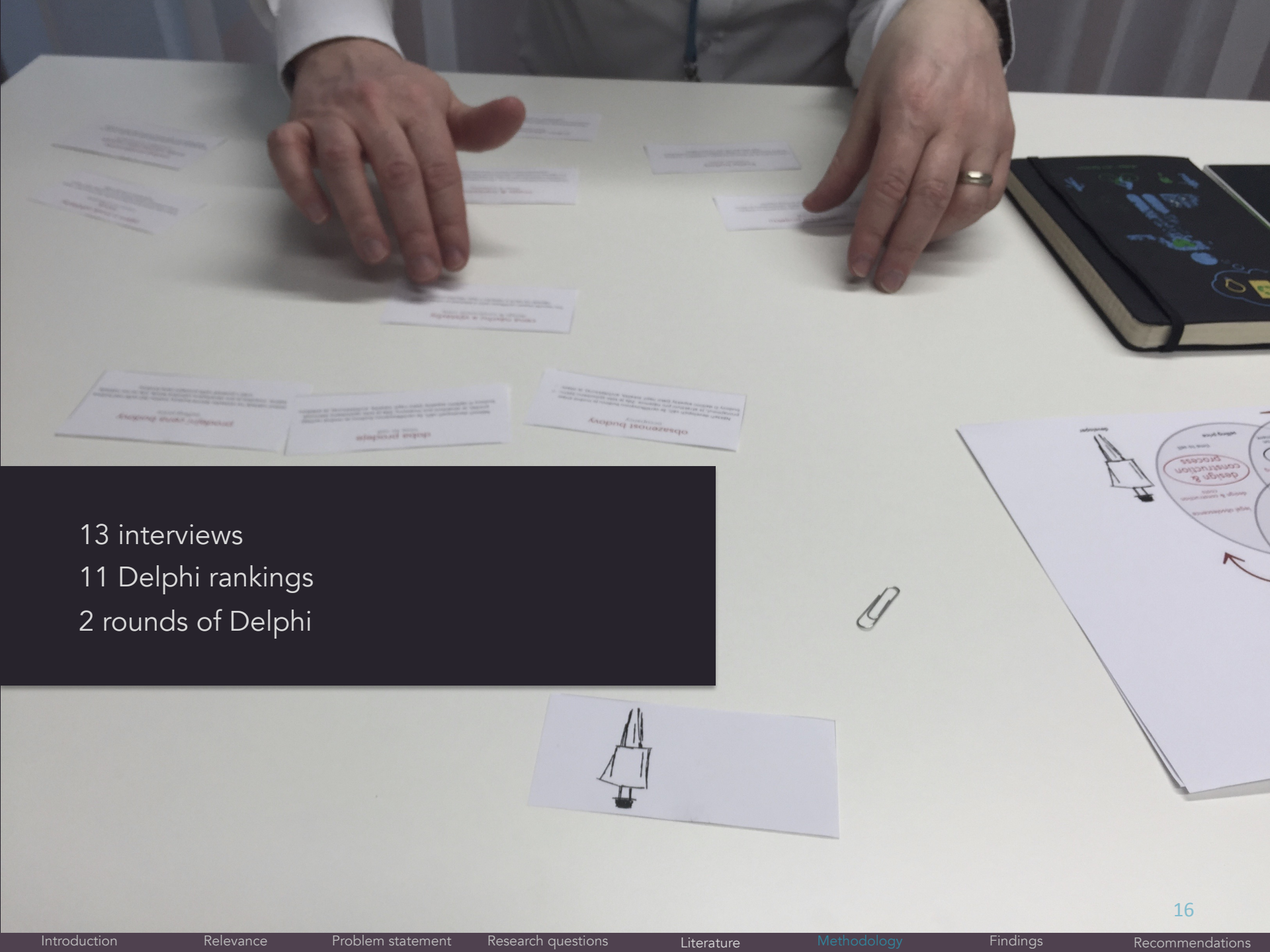


prime office yields
%





What are the most important drivers and barriers of the development of certified office buildings in Prague and what is the perception of buildings' sustainability of main involved stakeholders in the Prague office market?



13 interviews
11 Delphi rankings
2 rounds of Delphi

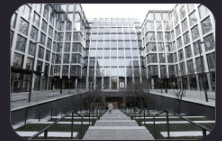
findings



ČSOB Radlická



City Green Court



other top certified offices

first certification

2007

2008

2009

2010

pioneers

2011

low-energy belief

2012

2013

theory vs. practice

2014

certification as
necessity

2015

stagnating market

2016

ROI and asset level at top ranks
 knowledge & interest ranked low (all actors)
 varying answers about design & construction costs
 complex regulatory environment



Developer's perspective																	
General profile (N=11)						Developer profile (N=5)						"Others" profile (N=6)					
sustainability factor	round 1		round 2		change	sustainability factor	round 1		round 2		change	sustainability factor	round 1		round 2		change
	mean	rank	mean	rank			mean	rank	mean	rank			mean	rank	mean	rank	
return on investment	1,91	1	1,55	1	=	return on investment	1,0	1	1,0	1	=	return on investment	2,7	1	2,0	1	=
selling price	3,00	2	2,55	2	=	selling price	2,6	2	2,2	2	=	selling price	3,3	2	2,8	2	=
occupancy	4,73	3	4,55	3	=	design & construction costs	4,6	3	4,2	3	=	occupancy	4,5	3	4,0	3	=
design & construction costs	5,36	4	5,73	4	=	occupancy	5,0	4	5,2	4	=	financing	4,8	4	5,5	4	=
financing	5,55	5	5,91	5	=	time on market	5,6	5	5,4	5	=	design & construction costs	6,0	5	7,0	5	=
time on market	6,45	6	6,55	6	=	building's quality	6,4	7	6,2	6	↑	building's quality	6,7	7	7,0	6	↑
building's quality	6,55	8	6,64	7	↑	financing	6,4	6	6,4	7	↓	interest in sustainability	8,5	10	7,0	7	↑
image & marketing	6,45	7	7,27	8	↓	image & marketing	6,6	8	7,2	8	=	image & marketing	6,3	6	7,3	8	↓
legal obsolescence	7,00	9	7,55	9	=	legal obsolescence	7,0	9	7,4	9	=	time on market	7,2	9	7,5	9	=
interest in sustainability	9,36	10	8,55	10	=	interest in sustainability	10,4	10	10,4	10	=	legal obsolescence	7,0	8	7,7	10	↓
knowledge of sustainability	9,64	11	9,18	11	=	knowledge of sustainability	10,4	11	10,4	11	=	knowledge of sustainability	9,0	11	8,2	11	=
Kendall's W	0,493		0,503		0,010	Kendall's W	0,728		0,782		0,054	Kendall's W	0,364		0,407		0,043



1 respondent-investor
highest Kendall's W
financially oriented
green banking
importance put to building's operation

Investor's perspective																	
General profile (N=11)						Investor profile (N=1)						"Others" profile (N=10)					
sustainability factor	round 1		round 2		change	sustainability factor	round 1		round 2		change	sustainability factor	round 1		round 2		change
	mean	rank	mean	rank			mean	rank	mean	rank			mean	rank	mean	rank	
return on investment	1,64	1	1,36	1	=	return on investment	1,0	1	1,0	1	=	return on investment	1,7	1	1,4	1	=
asset value	3,64	2	3,36	2	=	asset value	2,0	2	2,0	2	=	exit yield	3,4	2	3,5	2	=
exit yield	4,00	3	4,09	3	=	operating costs	3,0	3	3,0	3	=	asset value	3,8	3	3,5	3	=
occupancy	5,82	4	5,45	4	=	maintenance costs	4,0	4	4,0	4	=	occupancy	5,3	4	4,9	4	=
rent level	6,27	5	6,00	5	=	functional obsolescence	5,0	5	5,0	5	=	rent level	6,1	5	5,8	5	=
operating costs	7,55	6	7,91	6	=	building's quality	6,0	6	6,0	6	=	financing	8,0	8	8,1	6	↑
maintenance costs	8,36	10	8,27	7	↑	image & marketing	7,0	7	7,0	7	=	operating costs	8,0	6	8,4	7	↓
image & marketing	8,36	9	8,36	8	↑	rent level	8,0	8	8,0	8	=	image & marketing	8,5	10	8,5	8	↑
functional obsolescence	7,73	7	8,36	9	↓	interest in sustainability	9,0	9	9,0	9	=	maintenance costs	8,8	11	8,7	9	↑
building's quality	8,09	8	8,55	10	↓	exit yield	10,0	10	10,0	10	=	functional obsolescence	8,0	7	8,7	10	↓
financing	8,45	11	8,55	11	=	occupancy	11,0	11	11,0	11	=	building's quality	8,3	9	8,8	11	↓
interest in sustainability	9,64	12	9,18	12	=	knowledge of sustainability	12,0	12	12,0	12	=	interest in sustainability	9,7	12	9,2	12	=
knowledge of sustainability	11,45	13	11,55	13	=	financing	13,0	13	13,0	13	=	knowledge of sustainability	11,4	13	11,5	13	=
Kendall's W	0,471		0,512		0,041	Kendall's W	-		-		0,0	Kendall's W	0,505		0,556		0,051

low Kendall's W – heterogeneous group
 employer vs. employee
 financial aspects ranking highest
 paying attention to wellbeing
 personalities of companies' management



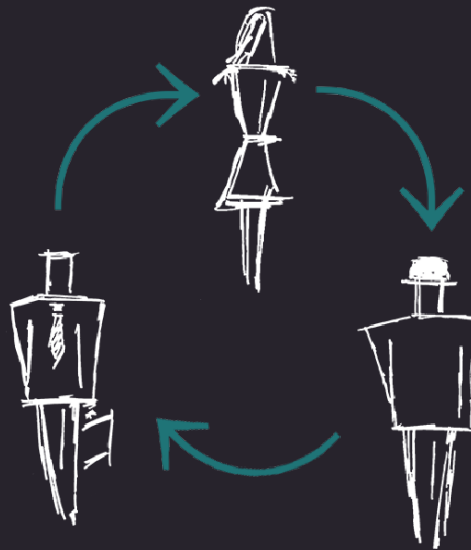
Tenant's perspective																	
General profile (N=11)						Tenant profile (N=4)						"Others" profile (N=7)					
sustainability factor	round 1		round 2		change	sustainability factor	round 1		round 2		change	sustainability factor	round 1		round 2		change
	mean	rank	mean	rank			mean	rank	mean	rank			mean	rank	mean	rank	
rent level	3,73	1	2,91	1	=	rent level	4,8	4	2,5	1	↑	rent level	3,1	1	3,1	1	=
operating costs	4,45	2	4,55	2	=	building's quality	3,3	1	3,8	2	↓	operating costs	4,3	2	4,1	2	=
productivity	5,09	3	4,82	3	=	productivity	4,8	3	4,0	3	=	staff happiness & satisfaction	5,6	6	5,3	3	↑
building's quality	5,18	4	5,09	4	=	operating costs	4,8	2	5,3	4	↓	productivity	5,3	4	5,3	4	=
staff happiness & satisfaction	5,73	6	5,64	5	↑	staff happiness & satisfaction	6,0	8	6,3	5	↑	maintenance costs	5,1	3	5,3	5	↓
maintenance costs	5,36	5	5,73	6	↓	maintenance costs	5,8	5	6,5	6	↓	staff health	5,9	7	5,6	6	=
staff health	5,91	7	6,09	7	=	staff health	6,0	6	7,0	7	↓	comfort	5,9	8	5,7	7	=
comfort	5,91	8	6,27	8	=	knowledge of sustainability	6,8	9	7,0	8	↑	building's quality	6,3	9	5,9	8	=
image & marketing	6,36	9	6,91	9	=	comfort	6,0	7	7,3	9	↓	image & marketing	5,4	5	6,3	9	↓
interest in sustainability	9,09	10	8,64	10	=	image & marketing	8,0	10	8,0	10	=	interest in sustainability	8,6	10	8,7	10	=
knowledge of sustainability	9,18	11	9,36	11	=	interest in sustainability	10,0	11	8,5	11	=	knowledge of sustainability	10,6	11	10,7	11	=
Kendall's W	0,267		0,302		0,035	Kendall's W	0,299		0,327		0,028	Kendall's W	0,368		0,392		0,024

Cross analysis: comparing standpoints and perceptions of developers and tenants											
Tenants' standpoint (N=4)			Developers' perception of tenants (N=5)			Developers' standpoint (N=5)			Tenants' perception of developers (N=4)		
sustainability factor	round 2		sustainability factor	round 2		sustainability factor	round 2		sustainability factor	round 2	
	mean	rank		mean	rank		mean	rank		mean	rank
rent level	2,5	1	rent level	2,2	1	return on investment	1,0	1	return on investment	2,3	1
building's quality	3,8	2	operating costs	3,6	2	selling price	2,2	2	selling price	3,0	2
productivity	4,0	3	staff happiness & satisfaction	4,4	3	design & construction costs	4,2	3	occupancy	4,2	3
operating costs	5,3	4	productivity	4,8	4	occupancy	5,2	4	financing	4,8	4
staff happiness & satisfaction	6,3	5	maintenance costs	5,2	5	time on market	5,4	5	interest in sustainability	5,5	5
maintenance costs	6,5	6	comfort	5,8	6	building's quality	6,2	6	design & construction costs	6,5	6
staff health	7,0	7	staff health	6,2	7	financing	6,4	7	knowledge of sustainability	7,3	7
knowledge of sustainability	7,0	8	building's quality	6,4	8	image & marketing	7,2	8	time on market	7,5	8
comfort	7,3	9	image & marketing	6,4	9	legal obsolescence	7,4	9	building's quality	8,0	9
image & marketing	8,0	10	interest in sustainability	10,2	10	interest in sustainability	10,4	10	image & marketing	8,0	10
interest in sustainability	8,5	11	knowledge of sustainability	10,8	11	knowledge of sustainability	10,4	11	legal obsolescence	9,0	11
Kendall's W	0,327		Kendall's W	0,599		Kendall's W	0,782		Kendall's W	0,445	



main sustainability drivers

- low or no cost premium for design & construction
- demand from investors and tenants
- occupants' wellbeing
- companies' image and CSR



main sustainability barriers

- insufficient knowledge and education about the benefits
- lack of available life cycle data
- unstable and unsupportive legislation

