

cradleto**to**cradle

INSPIRED REAL ESTATE

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“In the end, the success of our efforts will be measured against how we answered what we have found to be the fundamental question:”

“how do we love all the children, of all species, for all time ? “

- From *Cradle to Cradle*,
by William McDonough & Michael Braungart



“Our goal is a delightfully diverse, safe, healthy and just world, -with clean air, soil water and power- economically, equitably, ecologically and elegantly enjoyed“

- From *Cradle to Cradle*,
by William McDonough & Michael Braungart





Business as an engine for change..

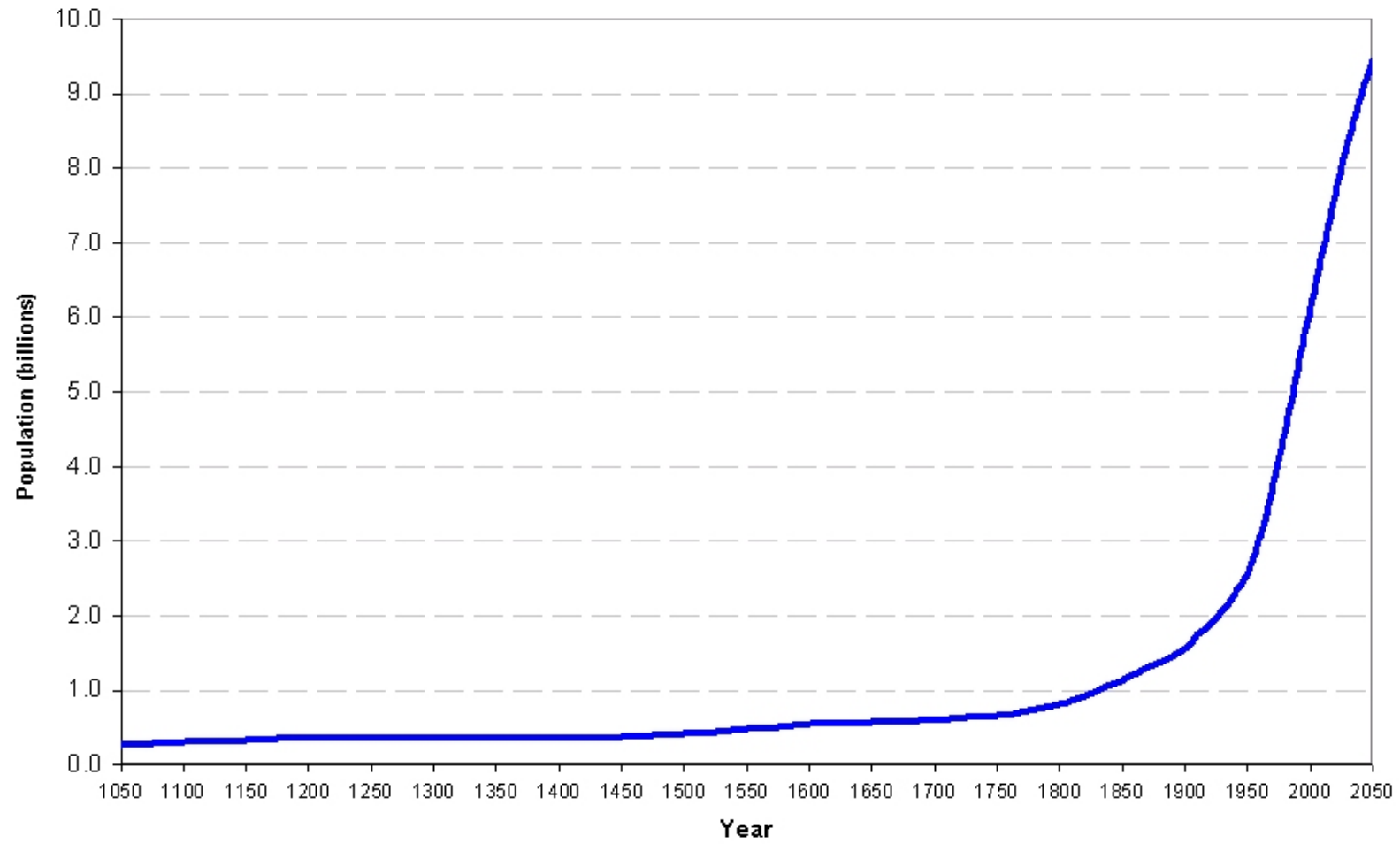






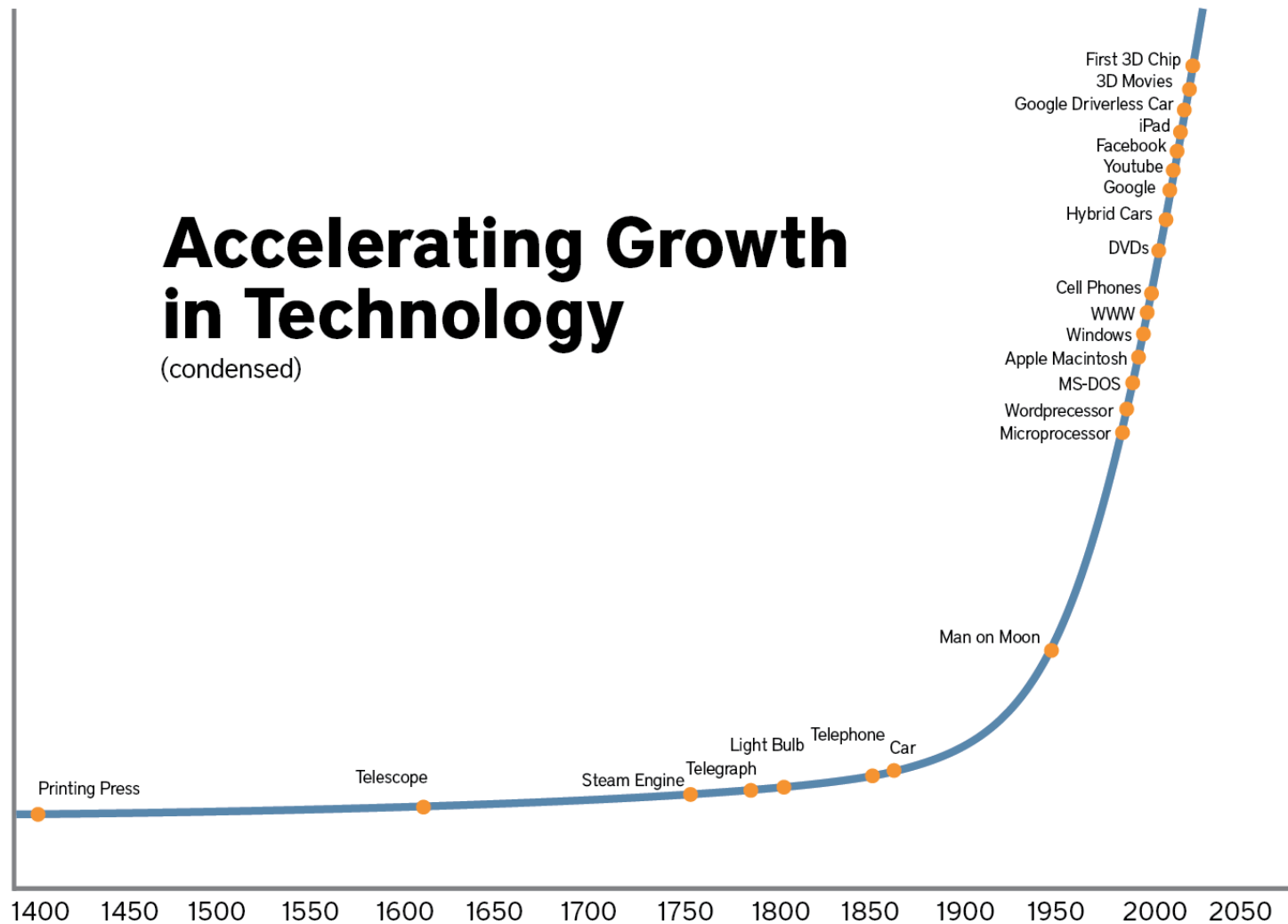
Rethink...

World Population and Growth Rate

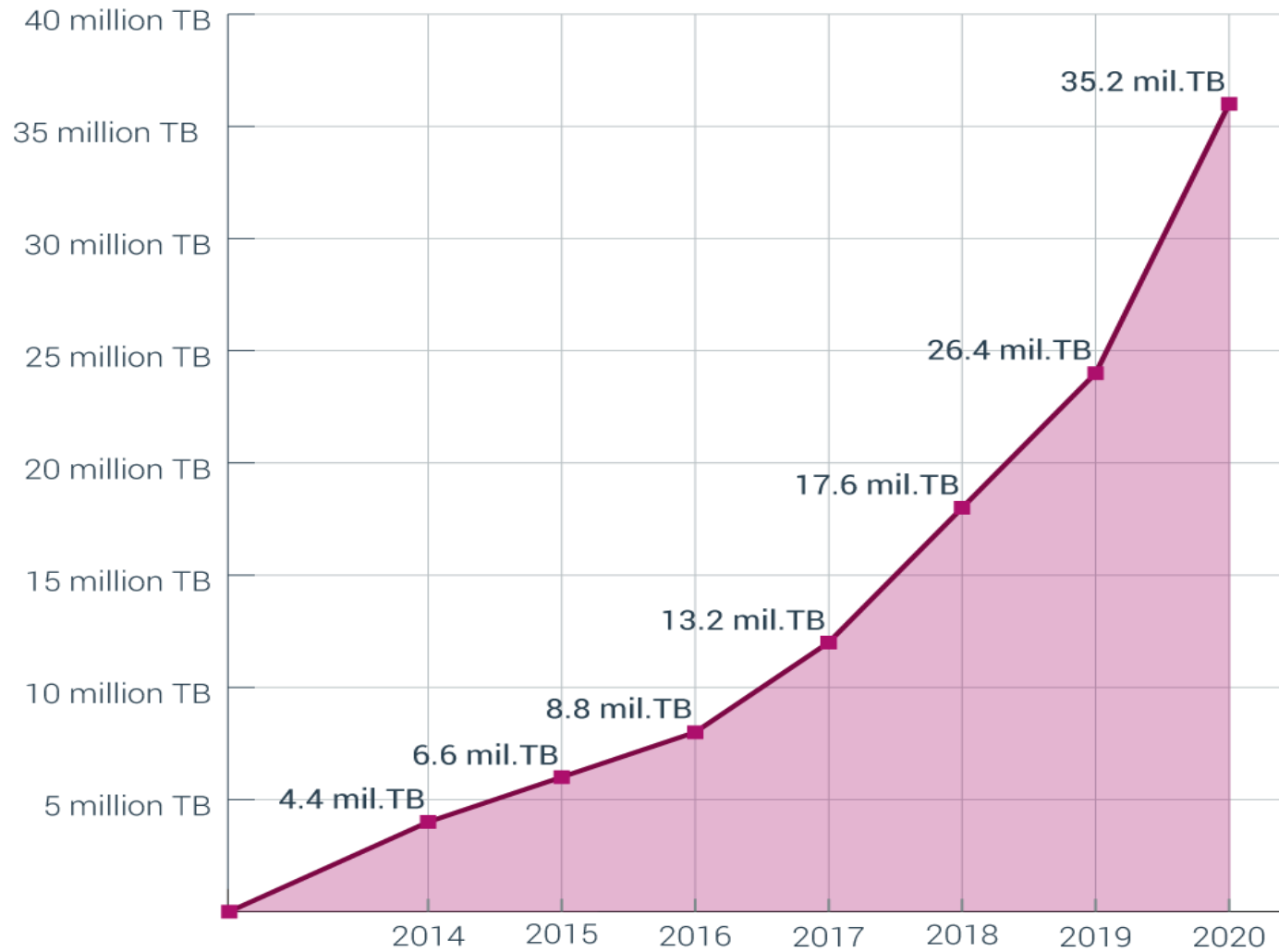


Accelerating Growth in Technology

(condensed)

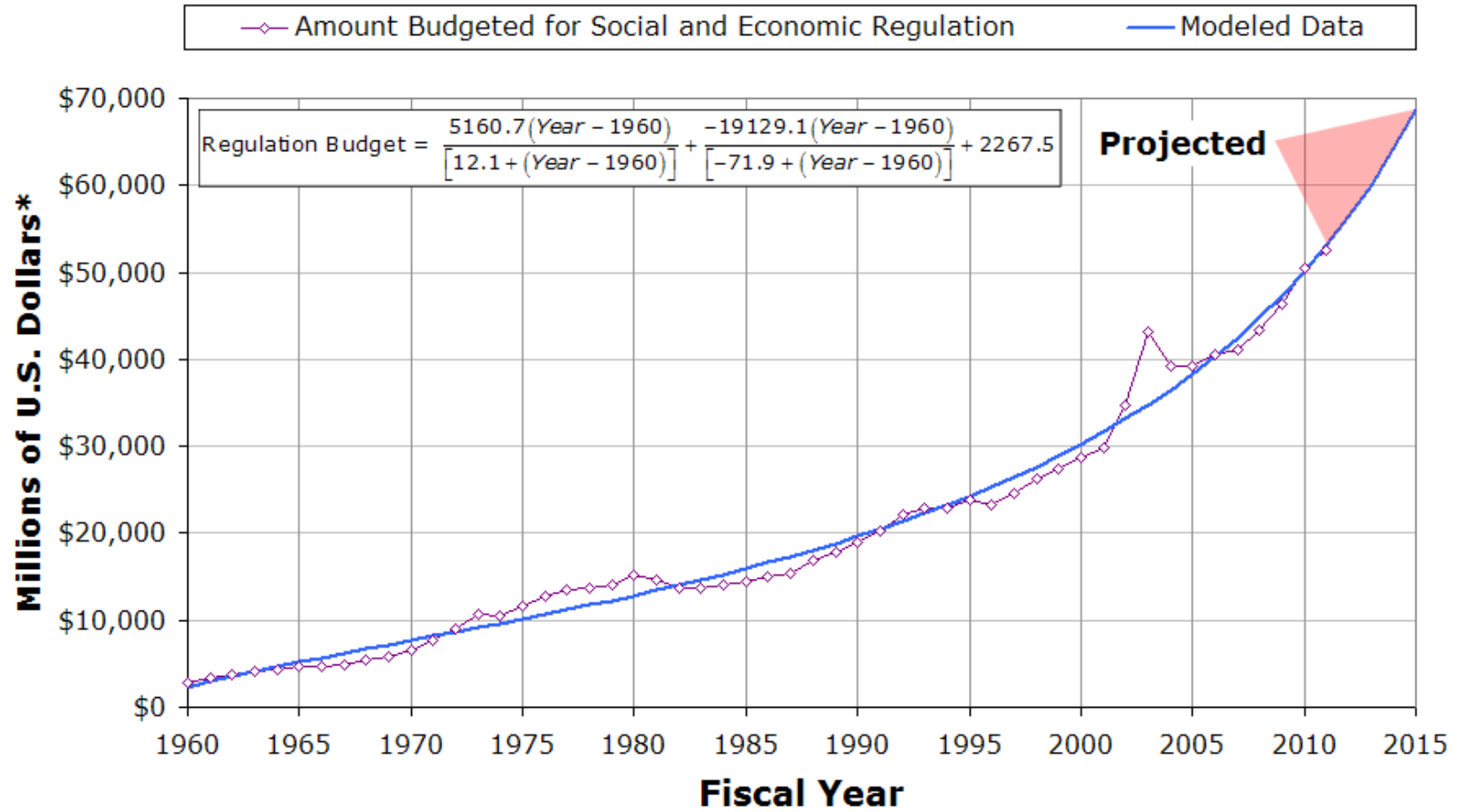


Information growth:

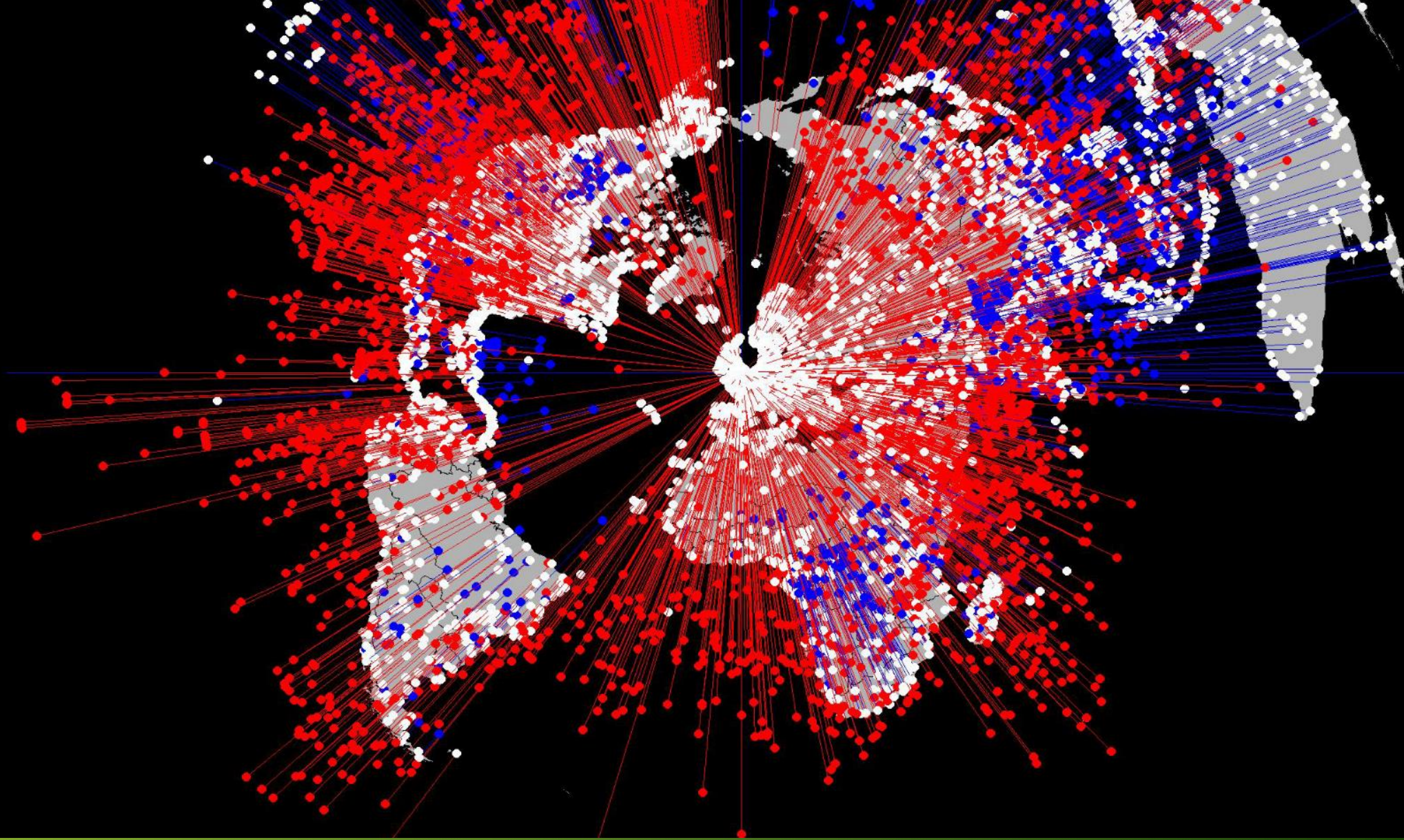



Source: IDC 2014

Growth of Federal Government's Budget for Social and Economic Regulation, Fiscal Years 1960-2011

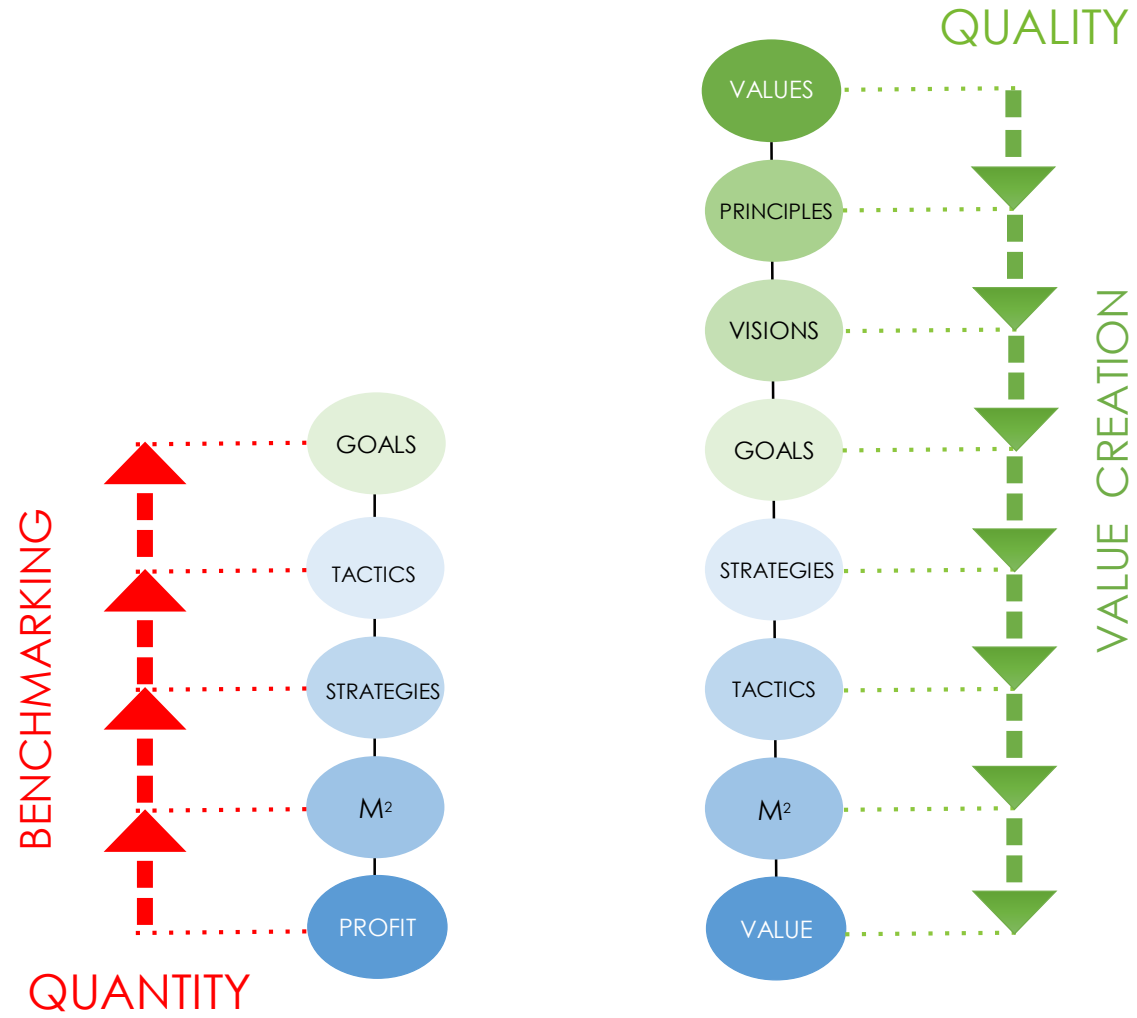


© Political Calculations 2010



It's not *hard* to
make **decisions** 
once you know what
your **VALUES** *are.*





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**USE HEALTHY AND SAFE
MATERIALS IN BIOLOGICAL AND
TECHNICAL NUTRIENT CYCLES**

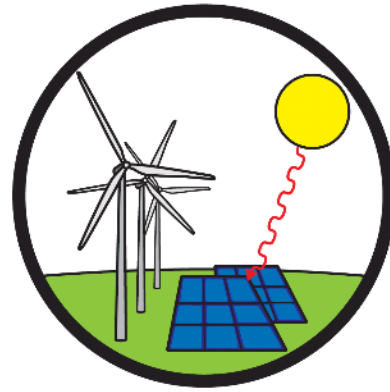


USE RENEWABLE ENERGY

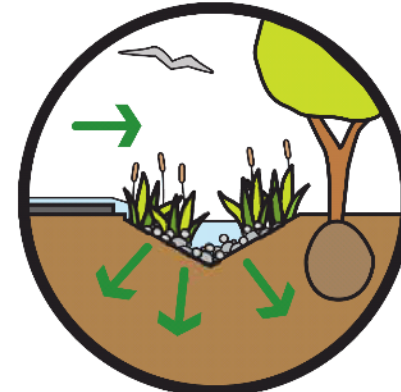
OPTIMIZE ENERGY USE AND INTEGRATE
CLEAN ENERGY PRODUCTION



**PROMOTE REVERSE LOGISTICS,
CONTINUOUS, ENDLESS RE-
USE, AND THE CREATION OF
NEW BUSINESS MODELS**

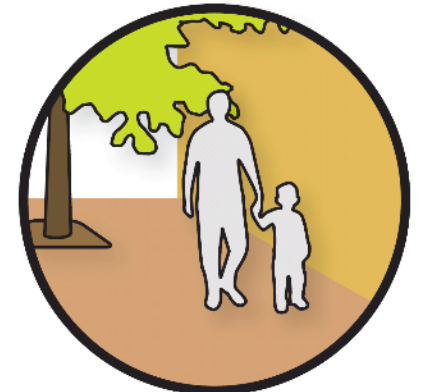


**PROMOTE COMMUNITY HEALTH
AND WELL-BEING**



**TREAT WATER AS A PRECIOUS
RESOURCE**

PROTECT, IMPROVE, OR RESTORE
WATER QUALITY, HYDROLOGY, AND KEY
NATURAL HERITAGE FEATURES AND THEIR
FUNCTIONS.





























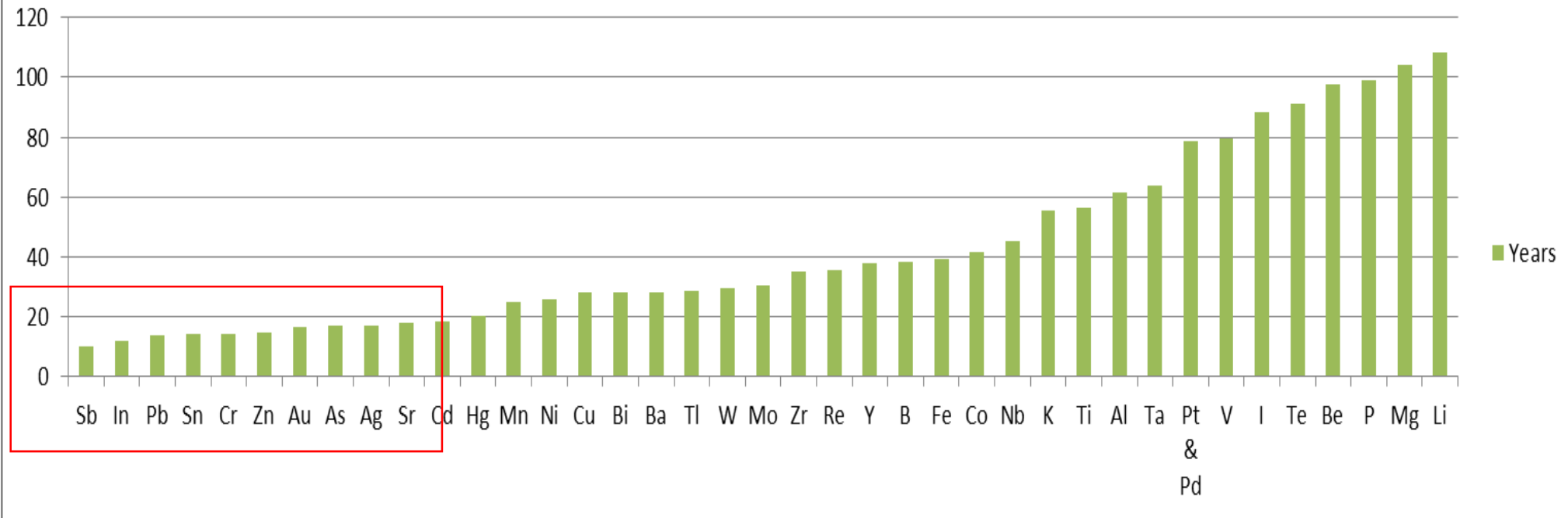


RAADHUISPLEIN PLAZA

BUILDINGS AS
MATERIALS
BANKS..

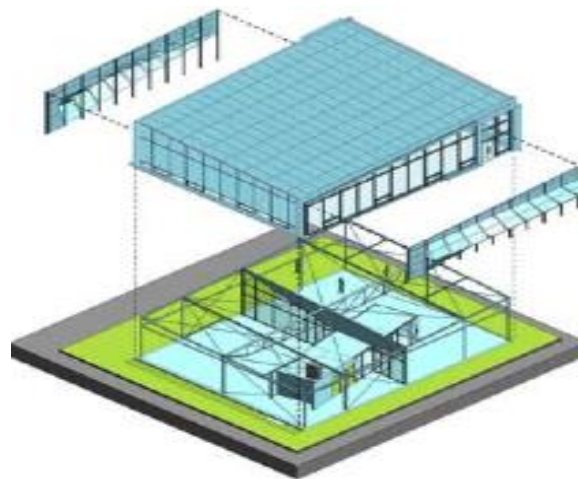
MINERAL COMMODITY SUMMARIES 2015

Years of resources left at 2% growth p.a.

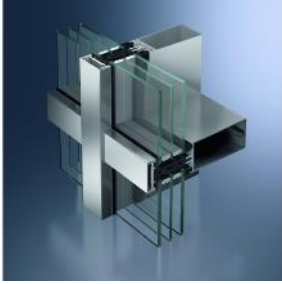


PG Luscure after AM Diederren

DESIGN FOR DISASSEMBLY.



Cradle to Cradle® certified materials.

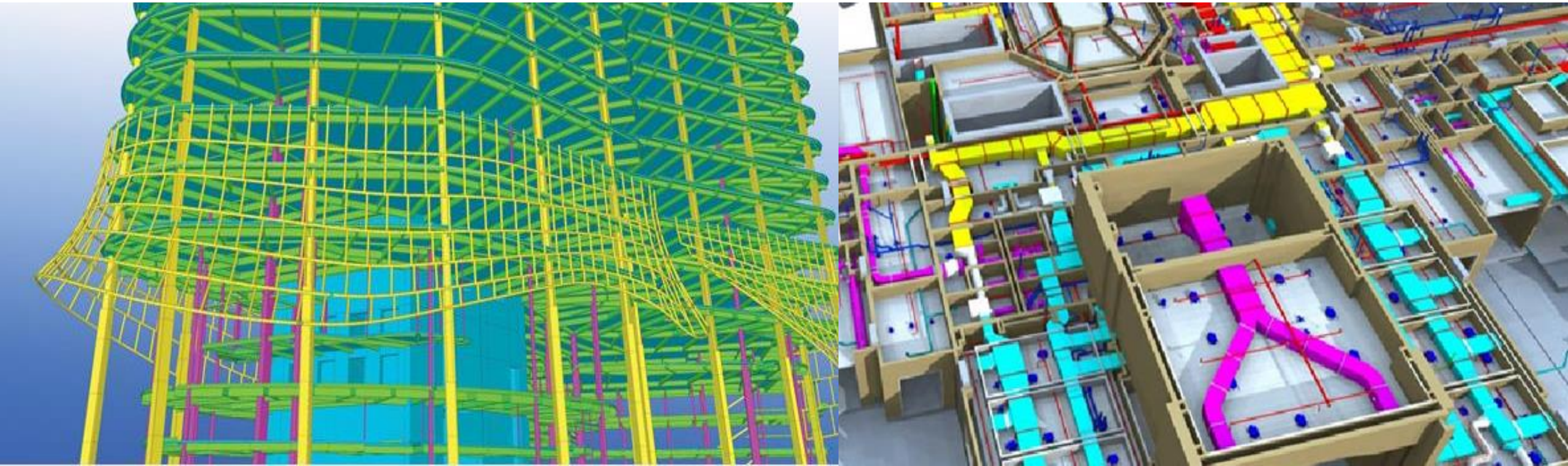


©Gyproc

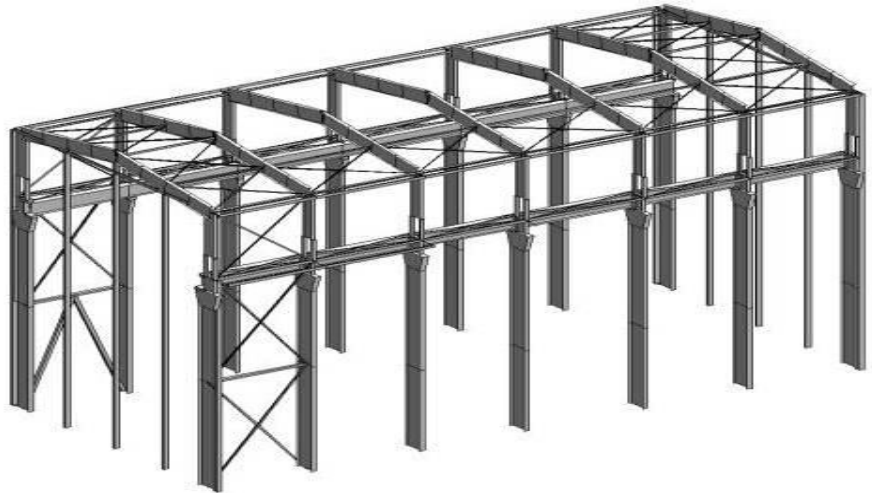


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Materials tracking – B.I.M.



FROM OWNERSHIP TO SERVICE.



LEDLEASE **LUXIMPROVE**
duurzaamlicht.nu

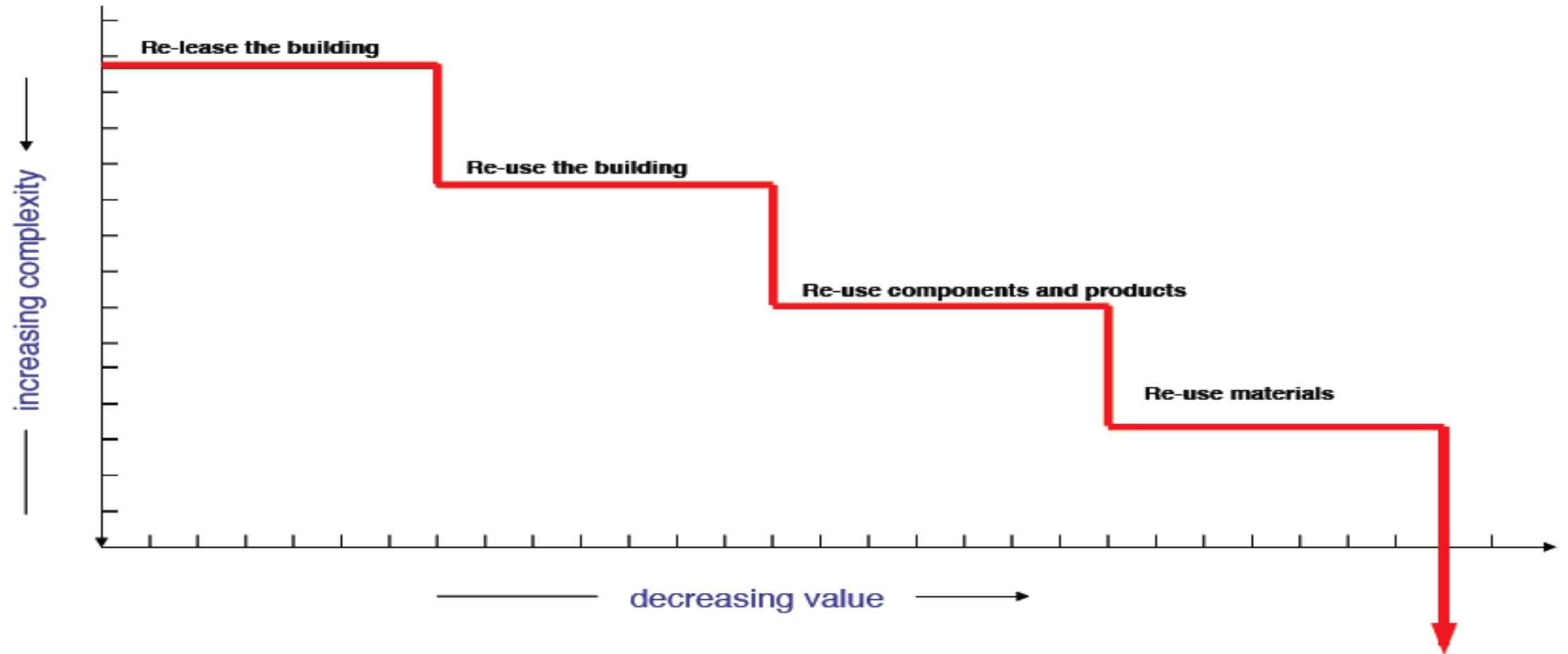
Start **saving energy** today!

Calculate LED savings Assess LED Quality

Optimize Cash Flow Compare LED Lamps



BUILDING RESIDUAL VALUE.



HEALTHY AND MORE PRODUCTIVE BUILDINGS.



Measuring..

CRITERIA	VALUE	RESOURCE	PROFILE	
Carcinogenicity	IARC 2A (probable human carcinogen), MAK 4 (carcinogenic potential with non genotoxic mechanism), ACGIH A2 (suspected human carcinogen)	MAK, IARC, ACGIH	Red	
Disruption of Endocrine System	Not listed as a known or suspected endocrine disruptor.	Colborn list	Green	
Mutagenicity	Positive Ames and eukaryotic tests, MAK 5 germ cell mutagen (germ cell mutagen of low potency, no problem as long as MAK value observed)	CCRIS, Gene-Tox, MAK	Red	
Reproductive Toxicity	Reproductive effects have been shown in rats after inhalation of formaldehyde, MAK 5 germ cell mutagen (germ cell mutagen of low potency, no problem as long as MAK value observed)	MAK, Cal Prop 65, RTECS	Red	
Teratogenicity	MAK C (no risk to fetus only if MAK value is observed)	MAK	Yellow	
Acute Toxicity	Oral LD50 =42 mg/kg mouse.	RTECS	Red	
Chronic Toxicity	Chronic Inhalation has shown biochemical, blood, and olfactory effects in rats	RTECS	Yellow	
Irritation of Skin/Mucous Membranes	very destructive to mucous membranes and upper respiratory tract	SAMSDS	Red	
Sensitization	MAK Sh (skin sensitizer)	MAK list	Red	
Others (carrier function, skin penetration potential)	No data.	NA	Green	

United Technologies THE IMPACT OF GREEN BUILDINGS ON COGNITIVE FUNCTION

24 PARTICIPANTS

6 DAYS OVER **2 WEEKS**

2 TESTS

1 Multivariable test for building types:

Conventional i.e., Typical Office	Green Low VOC	Enhanced Green Low VOC and High Ventilation
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2 Single-variable test for carbon dioxide:

Low CO ₂	Moderate CO ₂	High CO ₂
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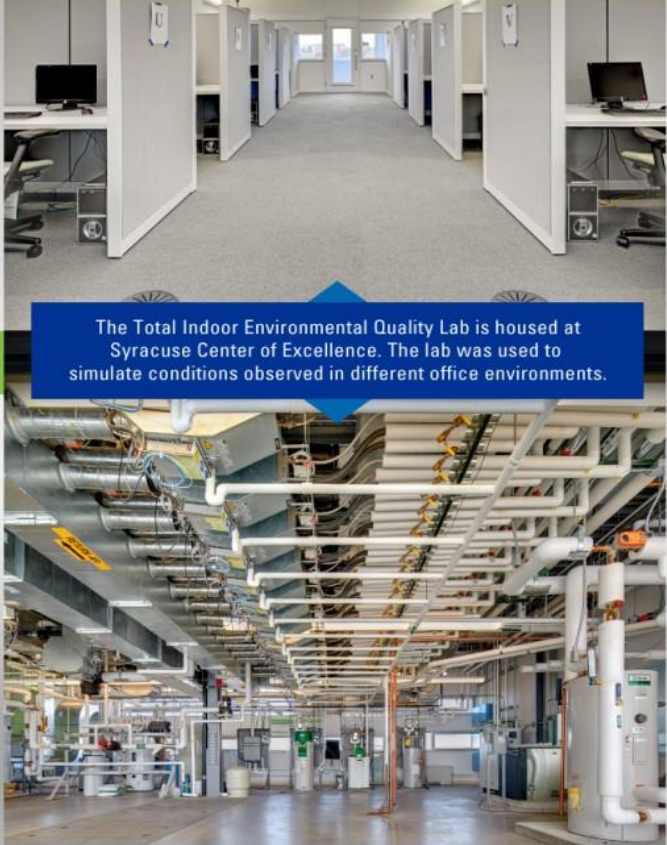
The Total Indoor Environmental Quality Lab is housed at Syracuse Center of Excellence. The lab was used to simulate conditions observed in different office environments.

PARTICIPANTS EXPERIENCED

- SIGNIFICANTLY BETTER COGNITIVE FUNCTION
- FEWER HEALTH SYMPTOMS
- BETTER PERCEIVED INDOOR ENVIRONMENTAL QUALITY

BASED ON THE FOLLOWING COGNITIVE FUNCTION DOMAINS

- Basic activity level
- Applied activity level
- Focused activity level
- Task orientation
- Crisis response
- Information seeking
- Information usage
- Breadth of approach
- Strategy



On average, cognitive scores were:

- 61 percent higher in green building conditions.
- 101 percent higher in enhanced green building conditions

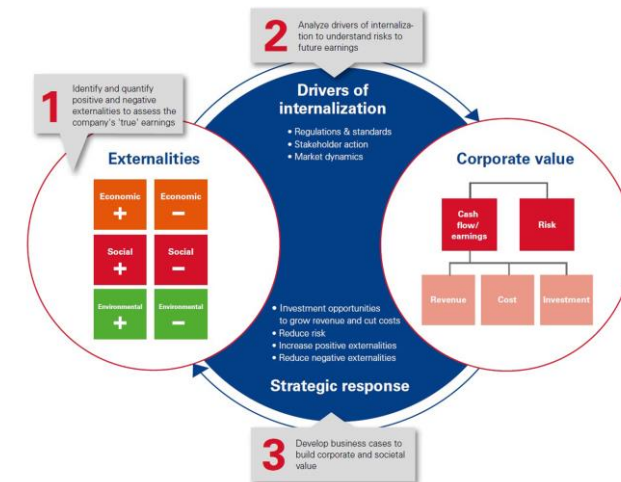
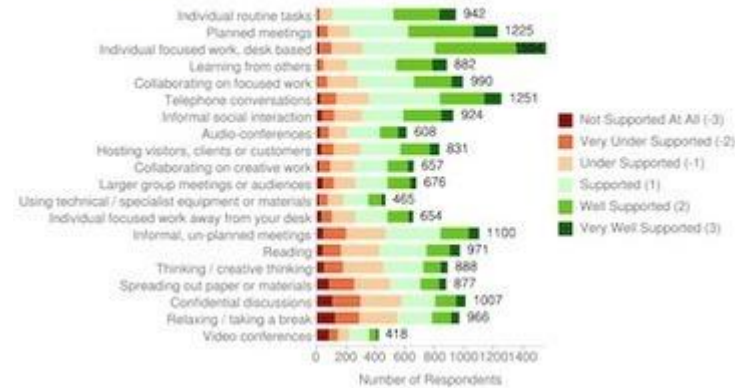
CO₂, VOCs, and ventilation rate all had significant, independent impacts on cognitive function.

Output	Inputs					
	Indoor Air Quality	Lighting	Thermal Comfort	Acoustics	Design & Layout	Aesthetics & Nature
Productivity	●	●	●	●	●	●
Performance	●	●	●	●	●	●
Health & Well-being	●	●	●	●	●	●
Psychological	●	●	●	●	●	●

Table 1. Qualitative strength of relationships between healthy building inputs and productivity outputs; Green = strong evidence; Yellow = identifiable link, may be inconclusive; Red = no evidence found.

Which activities do you feel are important in your work?

Ranked by: Satisfaction | Importance



CASE STUDY: DELTA DEVELOPMENT GROUP



Heerema, the occupant, could see a €42 million net present value over 20 years due to increased productivity, staff retention, and reduced absenteeism, according to KPMG.



ABOUT THE OFFICE

Voldellaan 47 is the global headquarters for Heerema Marine Contractors B.V. (HMC), housing 1,100 full time employees within 23,336 m² over 12 storeys.

The project was Delta Development Group's first foray into jointly measuring workplace effectiveness using the Leesman Index and KPMG's holistic True Value methodology for the measurement of social, environmental, and economic impacts of a commercial building; the first such attempt world-wide.

HEALTH AND WELLBEING ACTIONS

- Orientation of façades – optimise views and natural daylight while blocking solar heat gain
- LED lighting for artificial lighting needs
- Solar boilers combined with groundwater heating and cooling for further improvements to thermal comfort
- The use of low VOC and where possible Cradle to Cradle Certified™ materials.
- Considerably more biophilia than the previous building

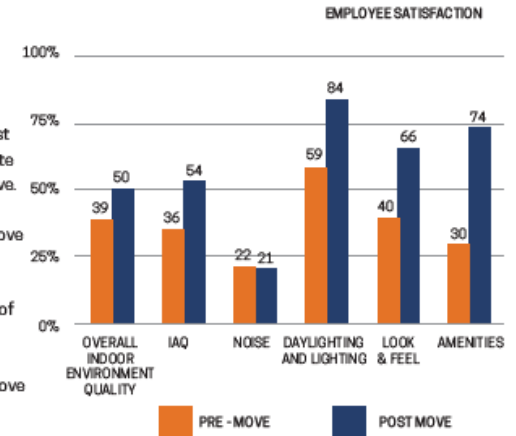


LEESMAN OCCUPANT SURVEY RESULTS

At Vondellaan 47, Delta and HMC worked together with Leesman to measure workplace effectiveness. Pre and post move Leesman surveys were conducted with a response rate of 405 employees (35%) pre-move and 433 (38%) post-move.

The Leesman Index (LMI) increased from a 57.7 LMI pre-move to a 70.1 LMI post-move, making this building the highest scoring building housing over 500 employees within the Benelux countries. With this score, it is within the top 5% of all Leesman projects world-wide.

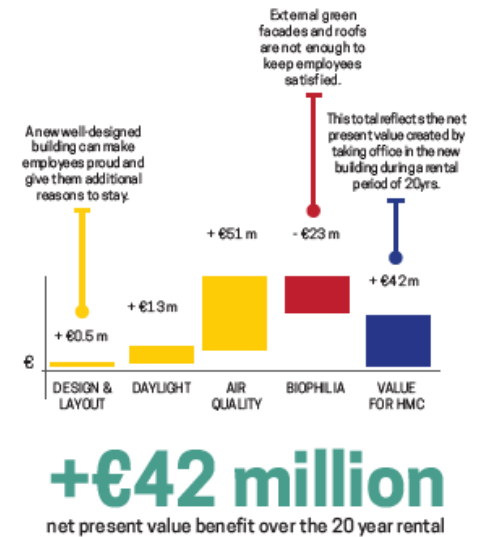
The Leesman study gives actionable results to further improve the working environment for those who are using it.



ECONOMIC IMPACT



KPMG supported the Delta Development Group with the application of its True Value assessment tool to quantify the impact of the building on productivity, absenteeism, and retention, using the results of the Leesman surveys and multipliers from literature on variation in those factors and the influence on costs and revenues. The results are shown below:



For more information on the KPMG True Value Methodology visit <https://www.kpmg.com/Globale/en/topics/climate-change-sustainability-services/Documents/introduction-kpmg-values.pdf>

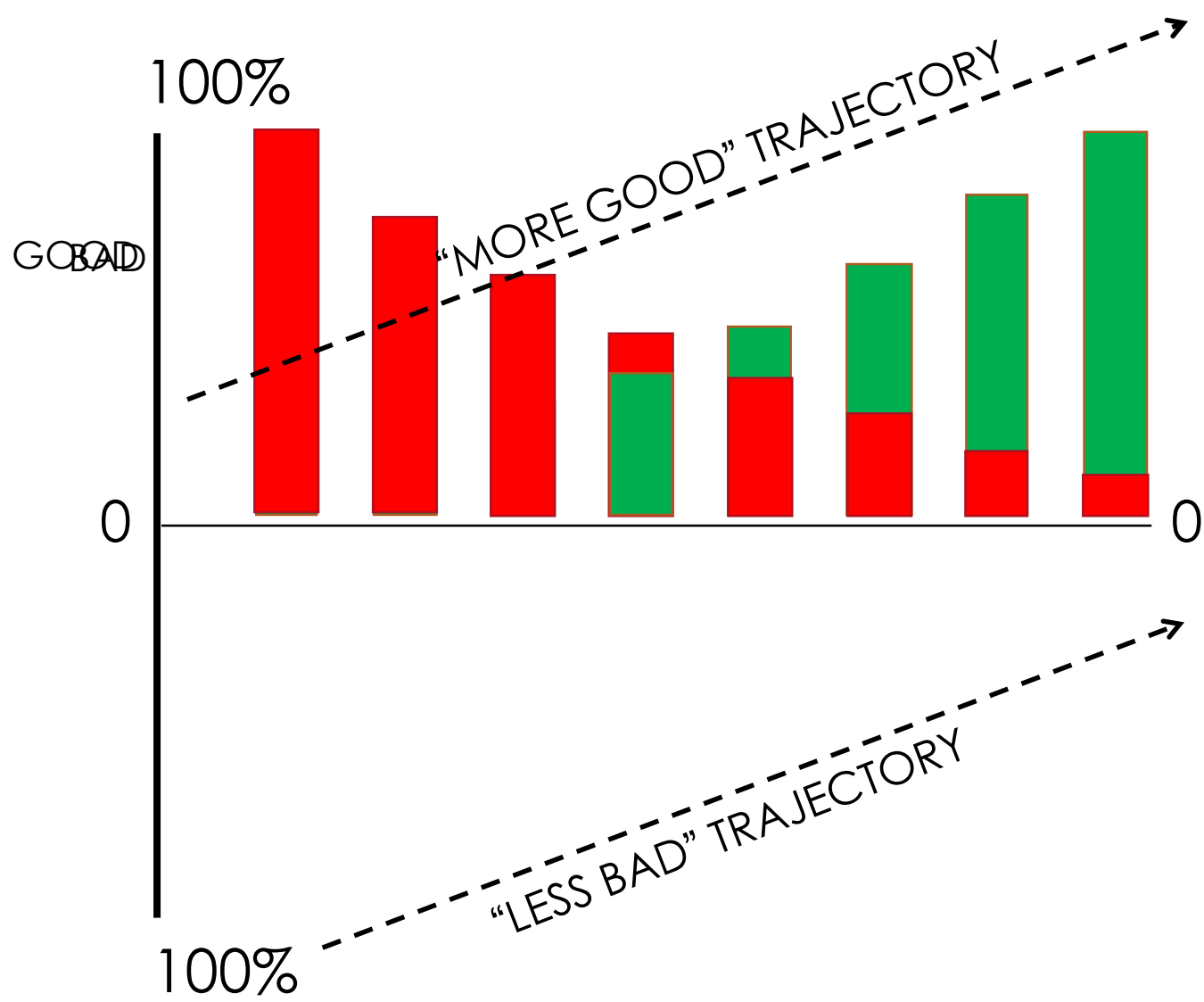




QUALITY

Over

QUANTITY



EFFICIENCY

Doing things the “right” way

EFFECTIVENESS

Doing the right things

The question is therefore:

WHAT IS THE RIGHT THING TO DO?



Rethink.
Lead.
Act.



**“If you think you are too small
to make a difference, try
sleeping with a mosquito.”**

