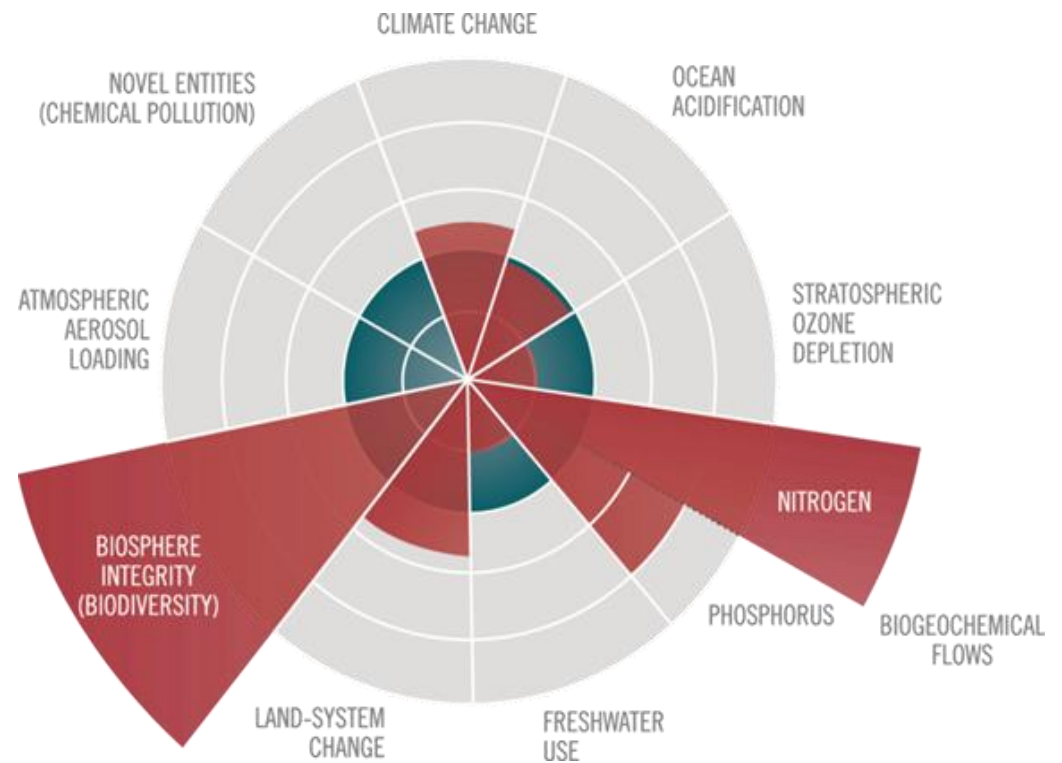


# Implementation of planetary boundaries on company level

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Zurich, June 12, 2015



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# Background

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## > Pictet Asset Management

- Pictet Group: \$438 bn Aum, PAM: \$154 bn Aum, of which thematic investment: \$26bn
- Environmental funds: Water, Clean Energy, Timber, Agri, Environmental Megatrend Selection

## > Environmental impact

- Weaknesses of existing approaches (SRI, ESG)
- Main focus on the environment; what companies do, not on how they do it
- PB framework as a workable and pragmatic 'scientific consensus'

## > Third-party validation & improvement (Neosys)

- A first in-house model with simplified assumptions
- Meet unease, suspicion about bank's motives and competence
- Think outside of the conventional SRI rating agency box

Source: Pictet Group data as at 31.12.2014, PAM data as at 31.03.2015, funds and mandates as at 31.04.2015.

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# Novelties

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- Application to sub-industry/company level
  - PB framework: planetary foremost, regional aspects, countries...
  - Break down to individual sub-industries and companies
  - Companies are crucial economic actors, we want to finance the right ones
- Operationalization of boundaries
  - From desired end state to concrete emissions or resource uses
  - Build a bridge from natural science to economic value creation
  - Extend and dare to go beyond the current PB framework
- Adjustments for Scope 3 and 4
  - Active products' use phase (scope 3) is rarely reported consistently
  - Products & services that 'catalyze' a change in resource efficiency at clients (scope 4)
  - Extended product responsibility; negative emissions (credits)

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# Application

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## > Definition of investment universe

- Tens of thousands of listed equities...
- Approximately 3'000 potentially interesting companies
- 300-400 active environmental contributors

## > Product positioning/differentiation

- Model is flexible and undogmatic
- Environmental technology fund, or low footprint investing
- Potential for emphasizing individual boundaries

## > Portfolio benchmarking

- Using the model the 'other way round'
- Compare any two conventional portfolios against each other or a benchmark
- Ratings, but also specific physical emissions for a given investment

# EIO-LCA: A performance database for economic activities

- EIO-LCA database provides environmental impact information per 1 Mio\$ of value creation of listed activities (app. 60 different impact indicators / app. 430 business activities). For commercial use, the database requires a license.

NAICS Code	Activity	NH3	NOx	PM10	PM2.5	SO2	VOC	Total	CO2 Fossil
		t	t	t	t	t	t	t CO2e	t CO2e
1111A0	Oilseed farming	7.31	5.3	33.6	6.78	2.64	3.58	3030	944
1111B0	Grain farming	20.2	6.63	36.2	9.35	3.33	5.59	4470	1120
111200	Vegetable and melon farming	6.11	2.93	29.8	5.22	2.27	2.14	1300	740
111335	Tree nut farming	4.77	2.79	29.4	5.15	2.29	2.17	1330	756
1113A0	Fruit farming	5.11	3.07	29.4	5.17	2.29	2.18	1370	753
111400	Greenhouse and nursery production	3.3	2.78	31.4	5.47	1.41	1.49	971	649
111910	Tobacco farming	9.88	8.15	32.7	6.27	3.64	3.41	3690	1600
111920	Cotton farming	13.3	6.82	32.5	5.98	4.25	2.48	4290	1670
1119A0	Sugarcane and sugar beet farming	8.58	8.02	33.7	7.98	2.87	5.11	2380	909
1119B0	All other crop farming	9.99	6.12	31.5	5.94	3.11	2.95	2530	1070
112120	Milk Production	21.3	5.09	8.16	2.06	2.82	2.15	4260	934
1121A0	Cattle ranching and farming	25.5	4.46	17.7	3.57	2.77	2.72	7750	1130
112300	Poultry and egg production	32.9	4.85	10.5	2.73	2.81	2.61	2360	1130
112A00	Animal production, except cattle and poultry and eggs	31.7	4.47	5.48	1.47	2.15	1.79	3620	851
113300	Logging	1.44	7.2	4.18	1.34	1.4	2.1	632	362
113A00	Forest nurseries, forest products, and timber tracts	3.68	15.3	10.3	3.2	2.76	3.31	1170	535
114100	Fishing	0.116	2.38	0.373	0.187	2.55	0.666	1310	1180

- ➔ companies are analyzed concerning their activity mix.
- ➔ after mixing there is an environmental impact profile of the company
- 🖐️ EIO-LCA information does not contain downstream impacts (e.g. of the products)

# Operationalization of the Planetary Boundaries

- A bridge is built between the available impact indicators and the 9 planetary boundary dimensions

INDEX MATRIX		unit per Mio\$	9	10	11	12	13	14	15	16	17	30	31	32	33	V	T	L	C	A	H	E	E	C	S	E	H	H	H
			NH3	NOx	PM10	PM2.5	SO2	VOC	Total	CO2 Fossil	CO2 Process	Total Air	Surface Water	U'ground Water	Land	air	air	air	air	air	air	air	air	air	air	air	air	air	
			t	t	t	t	t	t	t CO2e	t CO2e	t CO2e	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	
Climate Change	t CO <sub>2</sub> eq								#####																				
Ocean acidification	kmol H3O+		#####	#####			#####			#####	#####																		
Stratospheric Ozone depletion	kg CFC-11eq																												
Nitrogen + Phosphorous Cycle	kg Neq																												
Freshwater Use	m3												#####	#####															
Land system Change	kha																												
Biodiversity loss	Extinctions/MSY																												
Atmospheric Aerosol loading	nkg <sub>AE</sub>				#####	#####		#####																					
Chemical pollution	nkg <sub>CP</sub>											#####	#####	#####	#####														

- Different units of the same PB dimension are converted into one unit with the aid of LCA methodologies
- ➔ The set of EIO-LCA impact indicators is transferred into a 9-dimensional PB-profile

# Operationalization of the Planetary Boundaries

- The impact corresponding to “respecting the planetary boundary” = “staying within the safe operating space” is calculated / derived from the Rockström publications and other sources
- Calculating the safe operating boundary value is of very different complexity for the 9 PB dimensions.

## Example 1: land use

Land surface	149'420'021 km <sup>2</sup>	
Originally forested Area	66'500'011 km <sup>2</sup>	
Global boundary for forestation (Rockström)	75 %	
Global boundary for forestation (Rockström)	49'875'008 km <sup>2</sup>	
Remaining global boundary for total land use	83'125'013 km <sup>2</sup> *y	
Remaining global boundary for total land use	8'312'501 kha*y	
<b>Median land use per Mio\$ (EIOLCA)</b>	<b>0.0390 kha/Mio\$</b>	←
World GNP	75'592'941 Mio\$/y	
<b>Estimated today land use for economical purpose</b>	<b>2'948'125 kha*y</b>	← proposed global boundary
Probability "land use = unforested area"	0.30	← slightly transgressed today
Remaining global boundary for effective land use	2'493'750 kha	
<b>Global boundary for land use per Mio\$</b>	<b>0.0330 kha/Mio\$</b>	←

# Operationalization of the Planetary Boundaries

## Example 2: Biodiversity loss

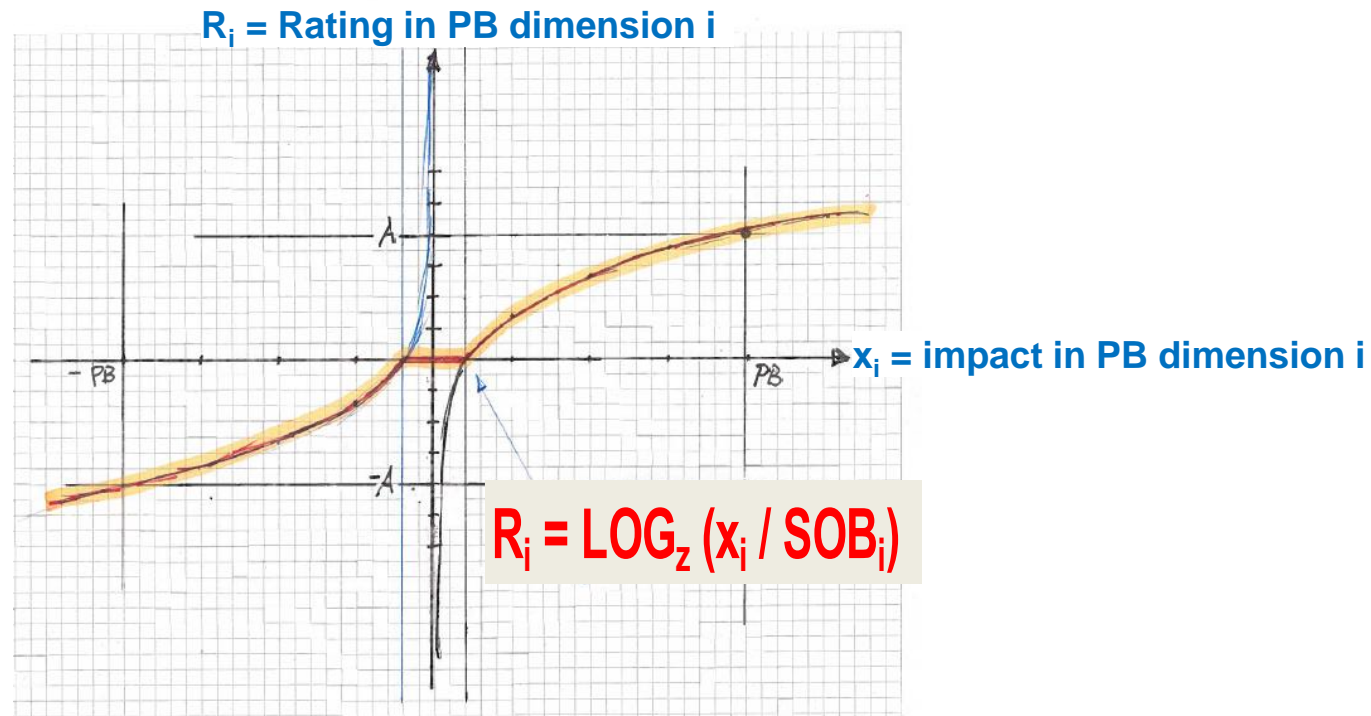
Conversion factors and SOpBoundary	Total	Land-use change	Global Warming	Eutrophication	Ecotoxic releases
<b>Biodiversity Loss Today (conservatively): E/MSY</b>	<b>100</b>	50	25	15	10
Contributions assumed		50%	25%	15%	10%
		kha	t CO <sub>2</sub> /y	kg N/y	kg 2,4D/y
Worlwide Impact of the contributors		1.60E+06	4.50E+10	2.05E+11	1.26E+10
		E/MSY per kha	E/MSY per t CO <sub>2</sub> e*	E/MSY per kg N*y	E/MSY per kg 2,4D*
Conversion Factor		3.13E-05	5.55E-10	7.32E-11	7.94E-10
<b>Proposed Boundary (Rockström): Extinctions per</b>	<b>10 E/MSY</b>				
<b>GDP 2014</b>	<b>75'592'941 Mio\$/y</b>				
<b>Global boundary per Mio\$</b>	<b>1.32E-07 E/MS*Mio\$</b>				

- Calculating the safe operating boundary is done for all 9 PB dimensions. For “aerosol loading” and for “chemical pollution” safe operating boundaries are postulated at a level of 3 times the actual global impacts.



## A scaling algorithm for the rating

- From the “impact in PB-dimensions” a numeric rating value is derived. This value is a comparison of the actual impact of the company with the safe operating boundary impact. The value is logarithmic and normalized in order to be at a certain value if the impact is equal to the safe operating boundary impact



- The rating values of the 9 PB dimensions are aggregated by calculating a weighted mean value. Weightings can be chosen.

# Model adjustments

- “Production adjustments” are applied to the impact values if the enterprise’s activities are different from the typical (EIO-LCA-listed) ones. So, if EIO-LCA default model is not properly reflecting a company-specific resource use or impact, a quantum factor is multiplied with the original GICS impact.

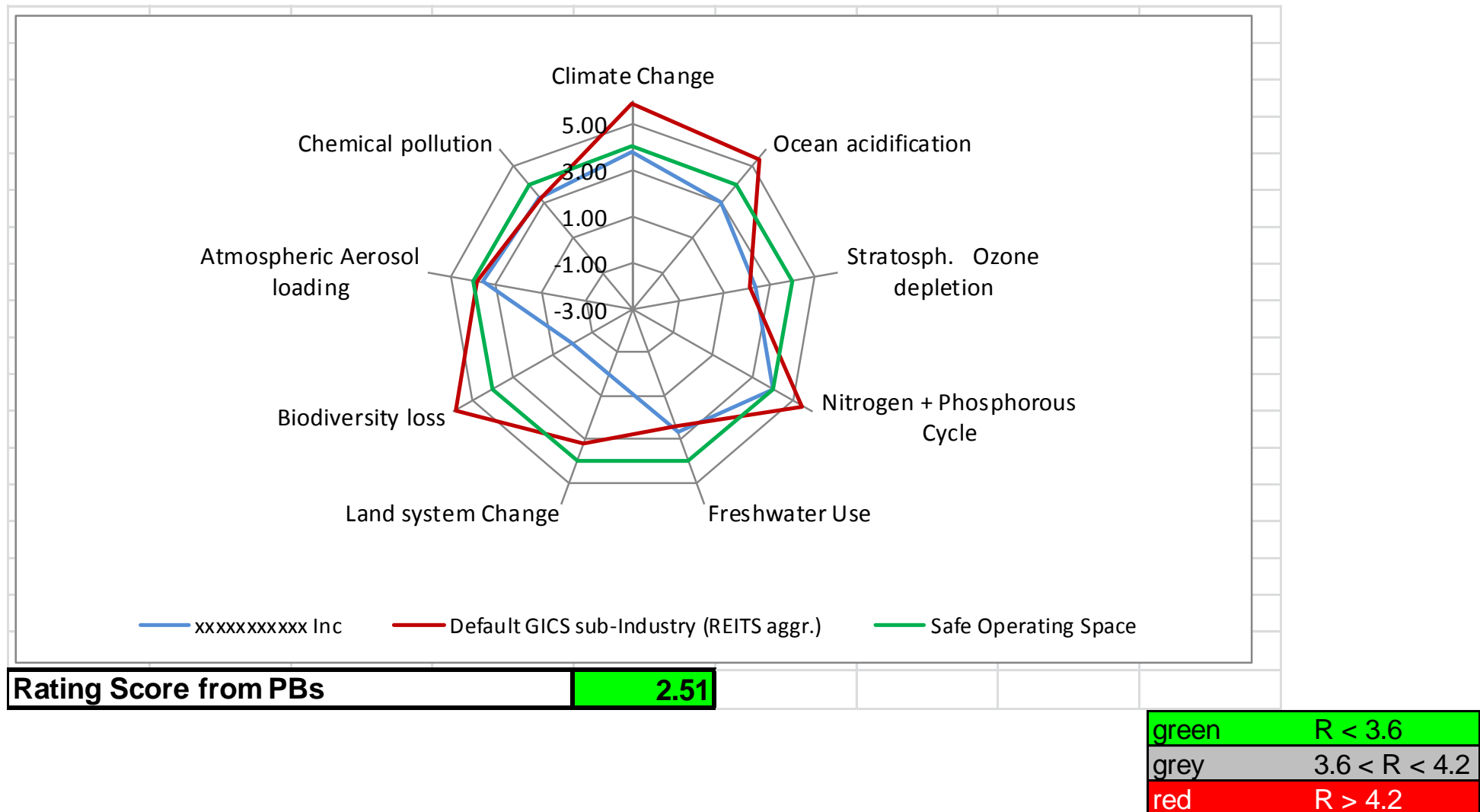
Production-related adjustments (production phase)								
Global Warming	Acidification	Strat. Ozone Depletion	Eutrophication	Freshwater	Land Use	Biodiversity	Aerosol loading	Chemical pollution
factor	factor	factor	factor	factor	factor	factor	factor	factor
1	1	1	1	0.3	0.3	1	1	1

- “Product adjustments” are applied to the impact values if there are significant downstream (positive or negative) impacts of the company’s products (scope 3 and/or scope 4). So, if the use-phase or the end-of life impact of a GICS sub-industry's typical products are important, a Product impact is added to the score. This impact is the global average impact per Mio\$ of any product times a quantum factor.

Product impact-related adjustments (use phase)								
Global Warming	Acidification	Strat. Ozone Depletion	Eutrophication	Freshwater	Land Use	Biodiversity	Aerosol loading	Chemical pollution
factor	factor	factor	factor	factor	factor	factor	factor	factor
3	0	0	-1	-1	-1	0	0	1

# Documentation & display of the ratings

- The rating is documented with a spider diagram and the aggregated rating value



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## Further development

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- Systematisation of the model adjustments
- Continuous actualisation:
  - according to EIO-LCA developments
  - according to further developments of the planetary boundary theory
- Refinement of some of the PB-operationalizations (e.g. Aerosol loading, Chemical Pollution, Ocean Acidification)

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# For more information, please contact

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