

NORTHERN TRUST ASSET MANAGEMENT

ESG Integration: a Risk-Return trade off?

STOXX Annual Conference

London. March 30, 2017

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NTAC:3NS-20

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NORTHERN TRUST: A GLOBAL LEADER IN ASSET MANAGEMENT

Providing innovative solutions to meet client objectives has earned the confidence of global investors.

IPE TOP ASSET MANAGER RANKING

Worldwide Assets¹

13TH LARGEST

Worldwide External Institutional Client Assets²

9TH LARGEST

Sovereign Entities

2ND LARGEST

Pension Funds

5TH LARGEST

Central Banks

3RD LARGEST

Actively Managed Assets

15TH LARGEST

Passively Managed Assets

4TH LARGEST

ESG Assets

13TH LARGEST

Factor Investing

Leaders in factor-based
investing since 1994

Best Smart Beta Strategies²

ESG

25+ Years Experience Managing
Socially Responsible Portfolios

UNPRI Signatory

Liquidity Solutions

5th Largest cash manager for
external clients

Efficient Market Exposure

Skilled management of
exposures and customized
solutions across asset classes

Innovative Product Structures

Leader in efficient product structures for European investors
Common Contractual Funds (CCF)
Fonds vor Gemene Rekening (FGR)

Unless otherwise noted, rankings are based on *Investments & Pensions Europe* June 2016 *Top 400 Asset Managers Survey*, assets managed for external clients.

¹Worldwide assets under management. ²Asia Asset Management, 2015. ³*Pensions & Investments* magazine's 2016 Special Report on the Largest Money Managers. ⁴Assets under management as of 9.30.16. ⁵Pensions and Investments as of March 31, 2016 The above rankings are not indicative of future performance.

ESG INVESTMENT STRATEGIES

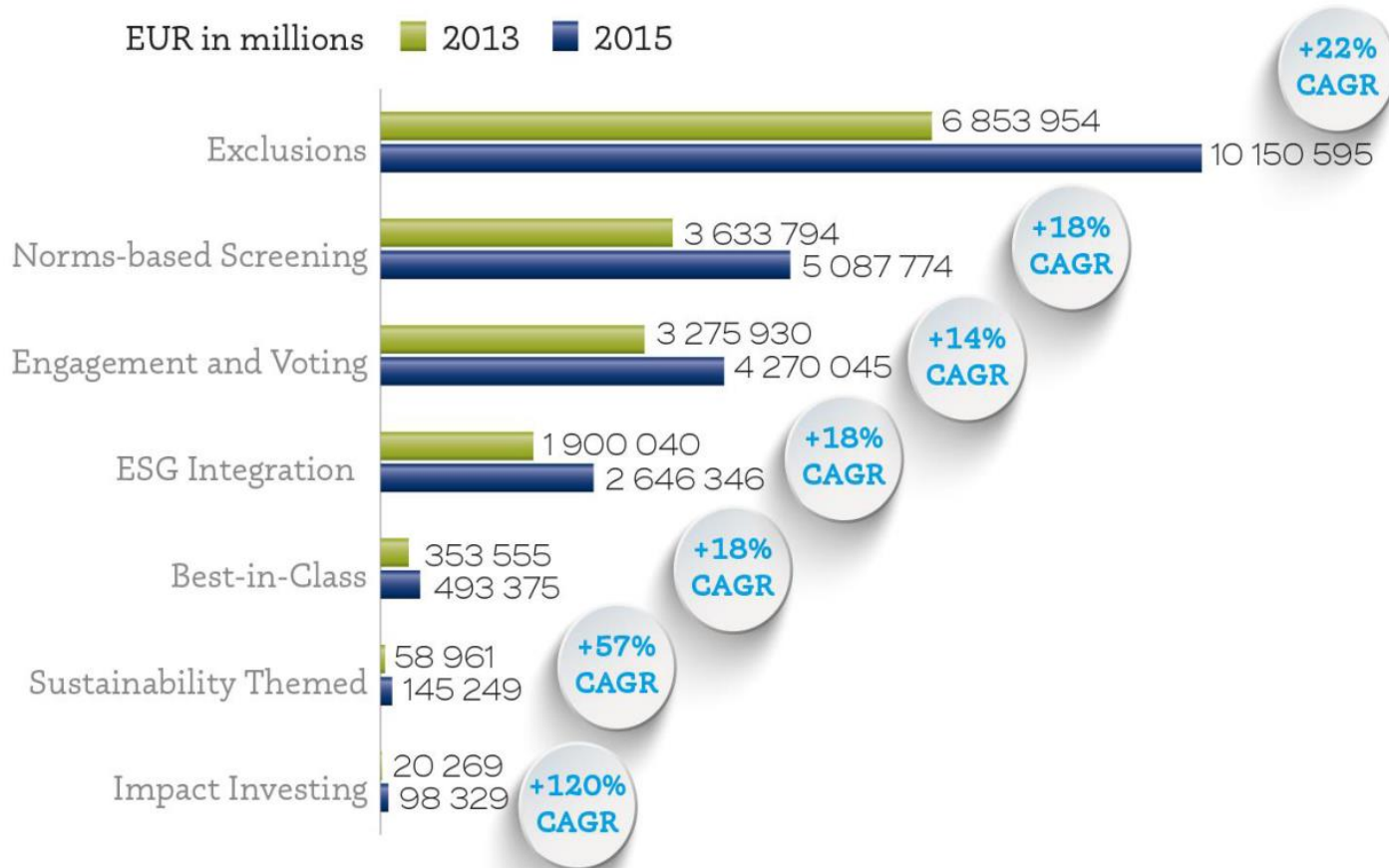
ESG can be implemented using the strategies below:

Sophistication of ESG strategy



ESG INVESTING IN EUROPE

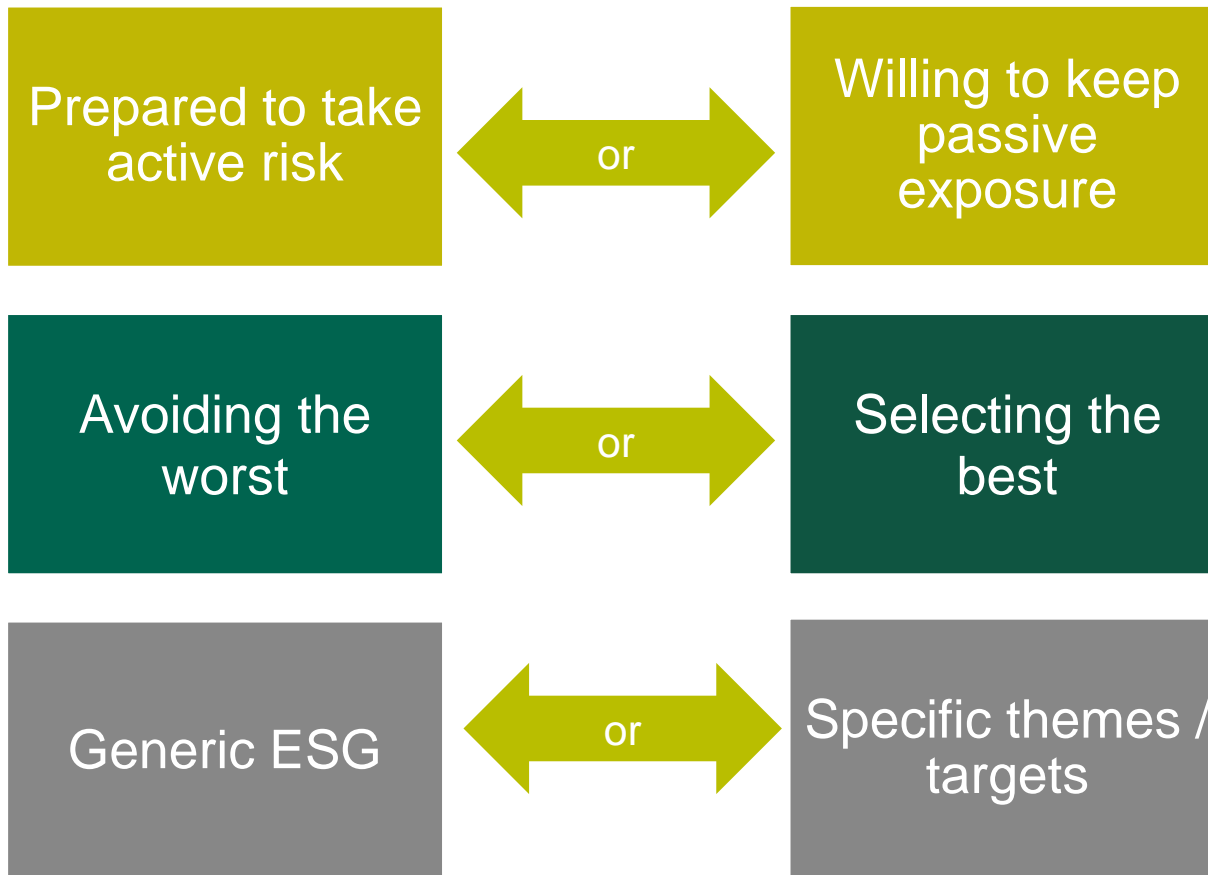
EuroSIF conducts studies every two or three years, where it asks investors about their sustainable investing strategies and calculates CAGR for different types



Data from the 2016 EuroSIF report

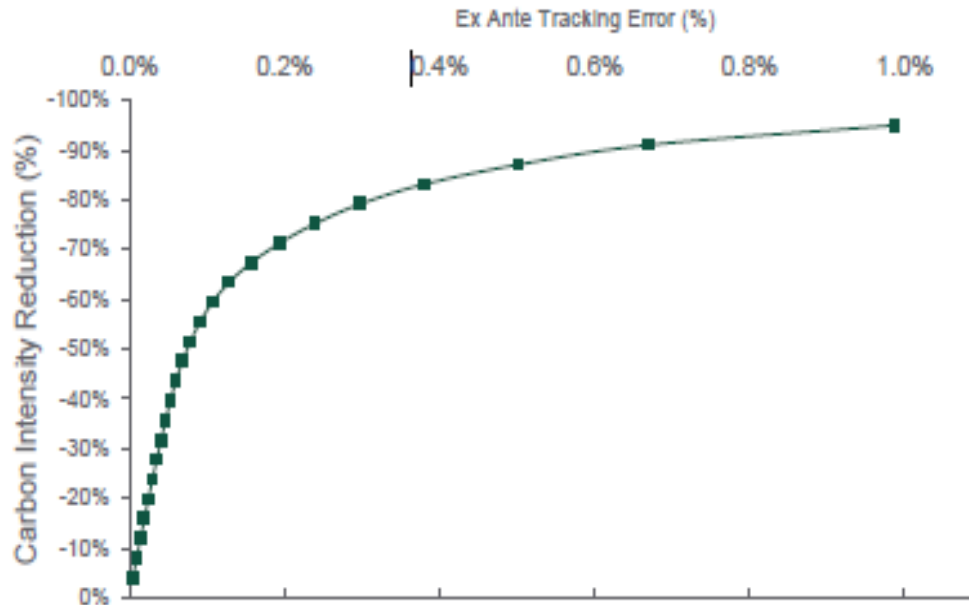
DIFFERENCES IN ESG APPETITES DRIVE CHOICES IN ESG INVESTING (PASSIVE AND ENGINEERED EQUITY)

ESG investing forms and tools can vary depending on the overall investment strategies



“TRAGEDY OF TRACKING ERROR”

Higher ESG effect always goes with higher active risk



As of March 31, 2016. Source: Northern Trust, MSCI. For illustrative purposes, we create a frontier of 25 portfolios that each minimizes tracking error for a given level of Carbon Intensity reduction (starting with zero reduction and ending with 95% reduction. No other constraints were applied.

What do you want to do? Depends on your risk tolerance. Two options:

1. Making a bet on ESG (“Smart Beta” approach)
2. Optimizing to reach maximum impact within a limited Tracking Error budget

CASE STUDY 1: GOVERNANCE SCREENS IN EMERGING MARKETS

Current market environment, both challenging and volatile, has caused many investors to take a closer look at how they implement investment decisions in emerging markets.

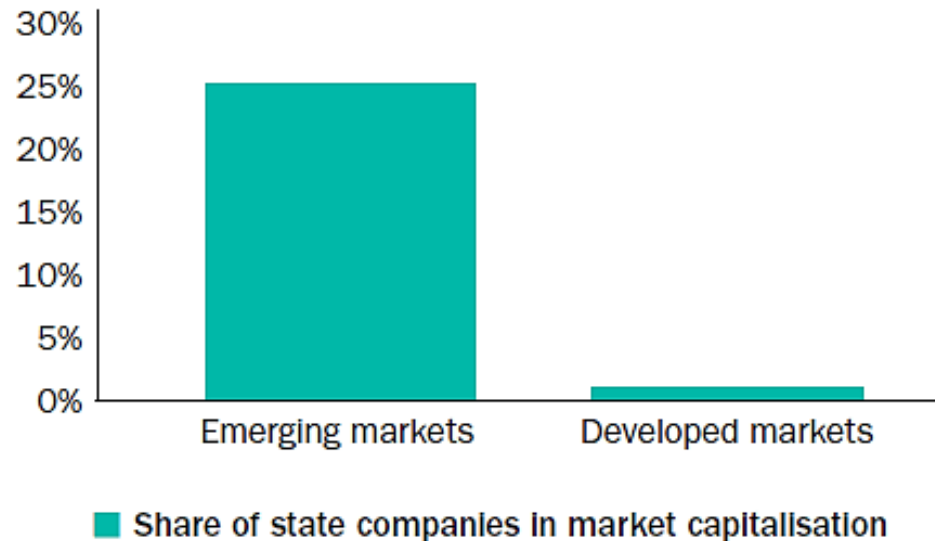
Investor concerns:

Large
controlling
shareholders

Companies that
are partly
owned by state
entities

Concerns about
whether SOEs
are always run
for the benefit of
all shareholders

Figure 02. Proportion of SOEs In market Indices

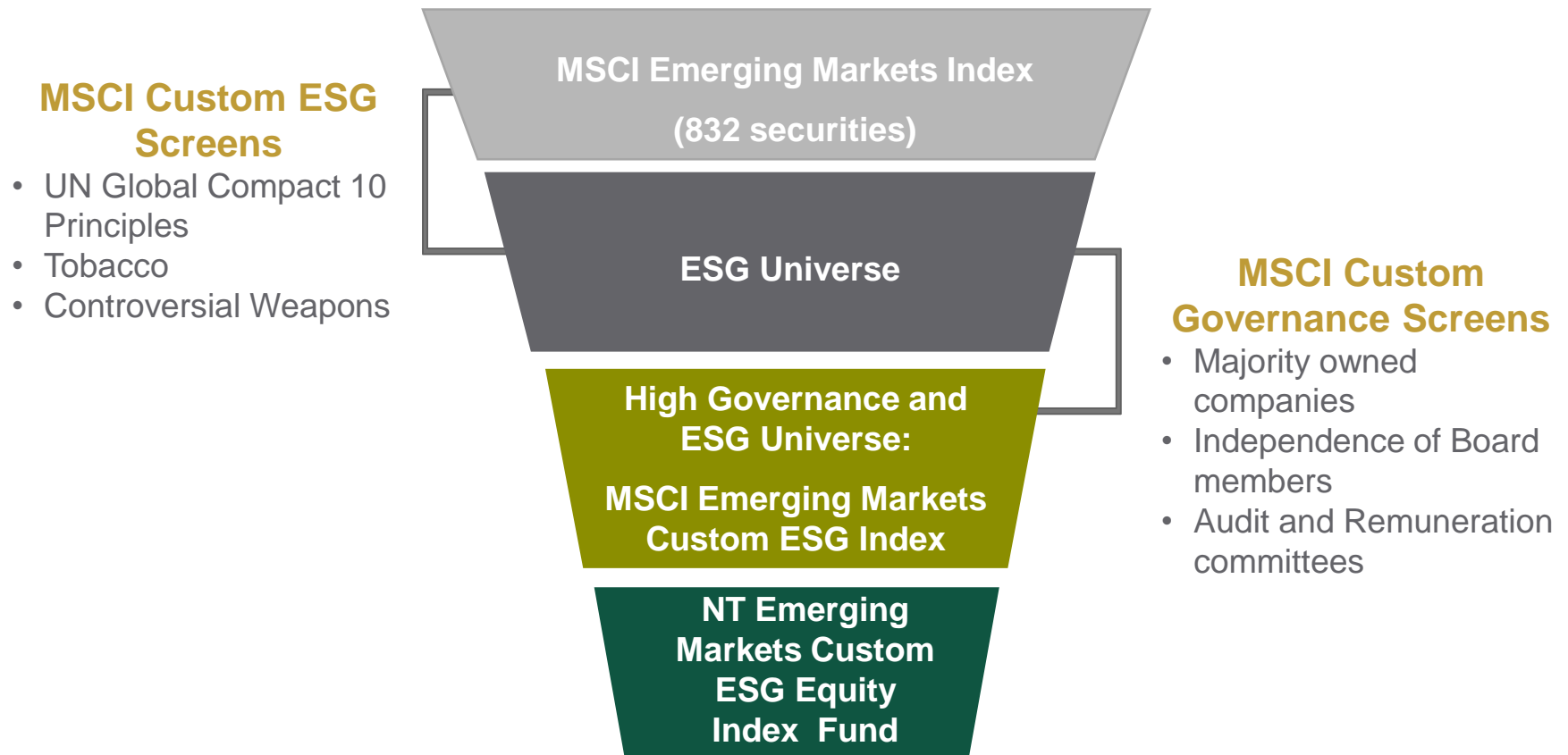


Source: *<http://www.towerswatson.com/en/Insights/IC-Types/Ad-hoc-Point-of-View/2014/02/Equity-investing-insights-into-a-better-portfolio>

The case studies presented are intended to illustrate products and services available at Northern Trust. They do not necessarily represent experiences of other asset managers nor do they indicate future performance. Individual results may vary

GOVERNANCE SCREENS IN EMERGING MARKETS: PROCESS

Methodology: The Northern Trust Emerging Markets Custom ESG Equity Index Fund goes through a six-step filtration process



NT EMERGING MARKETS CUSTOM ESG EQUITY INDEX (Q4 2016)

Tracking Error Attribution

ESG Screen	TE vs MSCI Emerging Markets
Controversial Weapons	0.06%
Global Compact	0.57%
Tobacco	0.15%
Governance	0.61%
Combined Basket	0.95%

Index Holdings

Emerging Markets ESG Index (Base Index)	780 (833)
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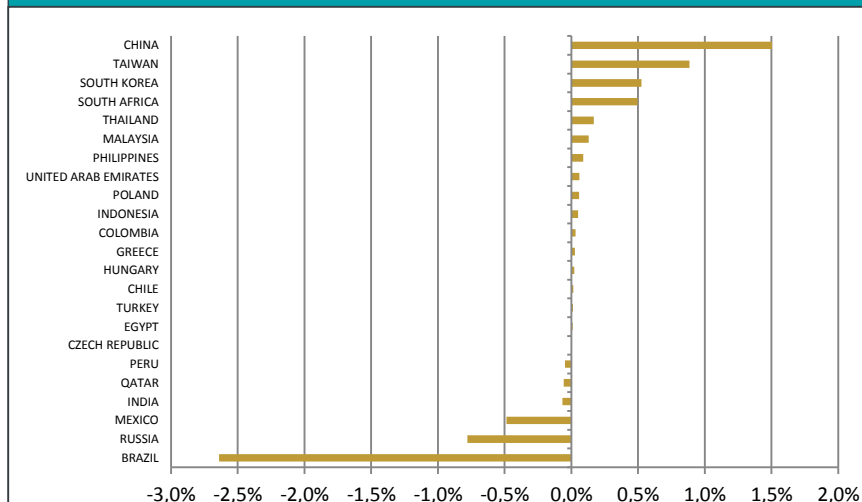
Screen Breakdowns

ESG Screen	Stocks	% Base Index (Mkt Cap)	% Base Index (Stocks)
Controversial Weapons	5	0.35%	0.60%
Global Compact	15	3.03%	1.80%
Tobacco	8	0.84%	0.96%
Governance	25	2.71%	3.00%
Combined Basket *	53	6.57%	5.76%

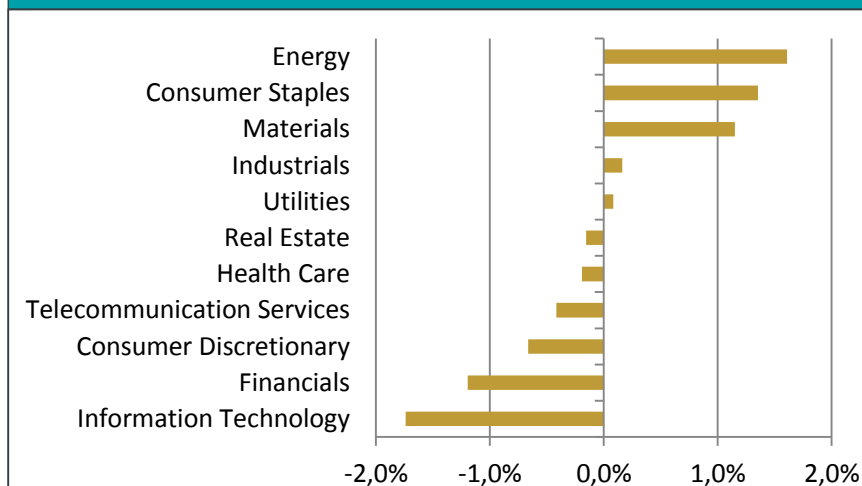
* Securities may appear in more than one basket, which may lead to duplication.

Information is provided to illustrate typical sectors and securities in which the portfolio may invest and to reflect representative portfolio characteristics. It should not be considered investment advice or a recommendation to buy or sell any security. There is no guarantee that securities remain in the portfolio or that securities sold have not been repurchased. It should not be assumed that any investments were profitable or will prove to be profitable, and past performance does not guarantee future results

Custom Index Relative Country Weights v MSCI Emerging Markets



Custom Index Relative Sector Weights v MSCI Emerging Markets



CASE STUDY 2. ENGINEERED EQUITY MEETS ESG

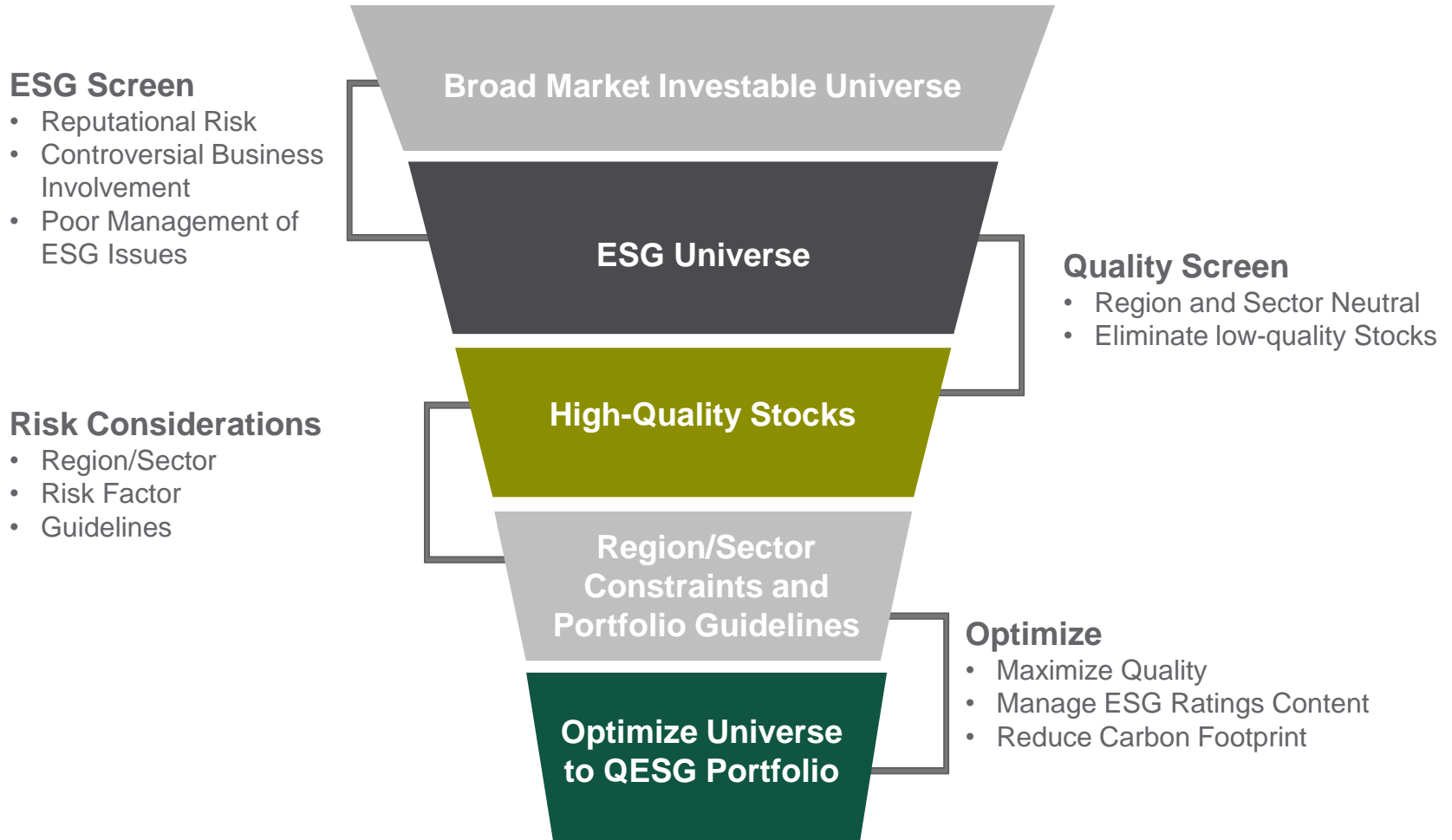
Northern Trust Quality ESG Strategy:

- *Integrates Northern Trust Quality Score with ESG criteria to screen out companies that have low Quality and low ESG scores*
- *Manages unintended risk exposures and keeps control over tracking error*

Northern Trust Quality Score	Typical ESG Issues
Convert assets into sales	Corruption and instability
Convert equity into returns	Business ethics and fraud
Convert invested capital into returns	Health and safety
Remain solvent	Privacy and data security
Self-finance	Toxic emissions and waste
Grow prudently without becoming over-extended	Biodiversity and land use
Meet dividend obligations	Carbon emissions
	Corporate Governance

QUALITY ESG: PROCESS

Integrating a compensated risk factor with ESG principles.



ESG PROFILE AND PERFORMANCE SUMMARY (6-YEAR BACK TESTED RESULTS)

**95 Co's or
9% MC**
excluded on ESG
criteria

1.52
Improvement in
ESG score

0.93
Information Ratio
since Inception

1.5%
Tracking Error
since Inception

As of 12/31/2016

ESG Analysis (As of 12/31/2016)

	MSCI ESG Rating	CO2 Emissions Reduction	Potential CO2 Emissions Reduction
MSCI World	5.42	0.0%	0.0%
NT QESG World	6.94	50.9%	58.4%
MSCI World ESG	6.50	3.9%	24.3%

As of 12/31/2016

Risk Adjusted Returns (Since Inception)

	Sharpe Ratio	Tracking Error	Information Ratio
MSCI World	0.77	N/A	N/A
NT QESG World	0.87	1.5%	0.93
MSCI World ESG	0.77	1.0%	-0.23

Note: Not actual portfolio results. Provided by Northern Trust Quantitative Research. Please see important information on Hypothetical Returns at the end of this presentation. For illustrative purposes only. Past performance is not indicative of future results. Returns reflect the reinvestment of dividends and other earnings and are shown before the deduction of investment management fees. Returns of the indexes also do not typically reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index. Indexes are the property of their respective owners, all rights reserved. As at 12/31/2015



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Important Information Regarding Hypothetical Returns- Where hypothetical portfolio data is presented, the portfolio analysis assumes the hypothetical portfolio maintained a consistent asset allocation (rebalanced monthly) for the entire time period shown. Hypothetical portfolio data is based on publicly available index information. All information is assumed to be accurate and complete but is not guaranteed. Hypothetical portfolio data contained herein does not represent the results of an actual investment portfolio but reflects the historical index performance of the strategy described which were selected with the benefit of hindsight. Components of the hypothetical portfolio were selected primarily utilizing actual historic market risk and return data. If the hypothetical portfolio would have been actively managed, it would have been subject to market conditions that could have materially impacted performance and possibly resulted in a significant decline in portfolio value.

As of 9/30/2016, Northern Trust Corporation had assets under management totaling \$945.8 billion. For purposes of compliance with the Global Investment Performance Standards (GIPS®), we have defined our firm as Northern Trust Asset Management Services, a subset of Northern Trust Asset Management, and includes those investment products managed by NTI, NTGIL, NTGIJ, and TNTC that are distributed through national channels. As of 09/30/2016 Northern Trust Asset Management Services had assets under management totaling \$775.8 billion.



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