

MSCI ESG INDEXES CONSULTATION

October 2017

This consultation may or may not lead to the implementation of any or all of the proposed changes in the highlighted or any other MSCI indexes. Consultation feedback will remain confidential. MSCI may publicly disclose feedback if specifically requested by specific market participants. In that case, the relevant feedback would be published together with the final results of the consultation.

PROPOSED ENHANCEMENTS TO MSCI ESG INDEXES

MSCI IS PROPOSING A SERIES OF METHODOLOGY ENHANCEMENTS TO BRING CONSISTENCY AND CLARITY AMONG ITS ESG INDEXES.

- 1. ENHANCEMENT TO CONTROVERSIAL WEAPONS EXCLUSION CRITERIA**
- 2. EXCLUSION OF WORST OFFENDERS FROM ALL ESG INDEXES** (e.g. non compliance with international norms and involvement in controversial weapons)
- 3. ENHANCEMENTS TO THE SRI AND ESG LEADERS METHODOLOGY –**

MSCI SRI Indexes	MSCI ESG Leaders Indexes
<ul style="list-style-type: none">▪ Enhancement to Values Based Exclusion (VBE) Screen▪ Addition of ESG Trend Factor	<ul style="list-style-type: none">• Removal of Values Based Exclusion (VBE) Screen• Addition of ESG Trend Factor• Removal of ESG Rating Buffer

MSCI invites feedback from market participants on or before January 31, 2018, and will announce the results of the consultation on or before February 22, 2018

PROPOSED ENHANCEMENT TO CONTROVERSIAL WEAPONS EXCLUSION CRITERIA

PROPOSED ENHANCEMENT TO CONTROVERSIAL WEAPONS SCREEN

- While there is no standard definition of controversial weapons, the ones most frequently identified by institutional investors are those that have been subject to widespread ban or restriction by international treaty

Existing screen	Proposed new screen
<ol style="list-style-type: none">1. Cluster Munitions2. Landmine3. Depleted Uranium4. Biological/chemical weapons	<ol style="list-style-type: none">1. Cluster Munitions2. Landmine3. Depleted Uranium4. Biological/chemical weapons5. Blinding lasers6. Non-detectable fragments7. Incendiary Weapons (White phosphorus)



The rationale to add three new screens is to reflect consensus in the market about what constitutes controversial weapons.

QUESTIONS:

- *Do you agree with the proposal to enhance the controversial weapons screen?*

PROPOSED EXCLUSION OF WORST OFFENDERS FROM ALL ESG INDEXES

PROPOSAL TO EXCLUDE RED FLAGS AND CONTROVERSIAL WEAPONS FROM ALL MSCI ESG INDEXES

- Following both the consultations on MSCI ESG Universal and MSCI Factor ESG Target Series Indexes, we have observed **consensus among investors on minimum exclusions when considering ESG in their investment processes**
- Those exclusions aim to reflect the common denominator among investors and refer to “worst offenders “:



GLOBAL NORMS

(very severe ESG controversies over the past 3 years)



CONTROVERSIAL WEAPONS

(landmines, cluster bombs, depleted uranium and biological/chemical weapons)



*The rationale to exclude “Worst Offenders” is to **maintain minimal ESG standards throughout our range of ESG Indexes***

QUESTIONS:

- *Do you agree with the proposal to exclude “worst offenders”?*
- *Do you think we should also exclude other controversial activities (e.g. Tobacco, thermal coal)?*

HIGHLIGHTS – PROPOSED EXCLUSION OF RED FLAGS AND CONTROVERSIAL WEAPONS

Methodology Name	Red Flag excluded currently?	Controversial Weapons excluded currently?
EX CONTROVERSIAL WEAPONS	No	Yes
EX COAL	No	No
EX FOSSIL FUEL	No	No
LOW CARBON LEADERS	No	No
LOW CARBON TARGET	No	No
GOVERNANCE QUALITY	No	No
WOMEN'S LEADERSHIP	No	No
EMPOWERING WOMEN INDEX	Yes	No
ESG UNIVERSAL	Yes	Yes
SUSTAINABLE IMPACT	Yes	Yes
ESG LEADERS	Yes	Yes
SRI	Yes	Yes
ESG FOCUS	Yes	Yes
KLD 400 SOCIAL	Yes	Yes
CATHOLIC VALUES	Yes	Yes
USA ESG SELECT	Yes	Yes
FACTOR ESG TARGET	Yes	Yes
MINIMUM VOLATILITY ESG TARGET	Yes	Yes

Index Name	Red Flag Weight	Controversial Weapons Weight
ACWI Ex CONTROVERSIAL WEAPONS	3.14%	-
ACWI ex COAL	2.91%	0.62%
ACWI ex FOSSIL FUELS	1.71%	0.66%
ACWI LOW CARBON LEADERS	3.10%	0.72%
ACWI LOW CARBON TARGET	1.76%	0.74%
WORLD GOVERNANCE-QUALITY	1.62%	0.58%
WORLD WOMENS LEADERSHIP	2.11%	0.31%
JAPAN EMPOWERING WOMEN	-	0.00%

* Weights in the Index as of Jun 01, 2017

HIGHLIGHTS – PROPOSED EXCLUSION OF RED FLAGS AND CONTROVERSIAL WEAPONS IN LOW CARBON INDEXES

- Back tested simulations as of June 01,2017, indicate that exclusion of Red Flags and Controversial Weapons from parent index may have lead to slightly lower carbon reductions in the Low Carbon Target Indexes and higher tracking error in the Low Carbon Leaders Indexes.
- The tracking error constraint might need to be relaxed in cases of Low Carbon Target Indexes in certain markets like Europe

Index Name	weights of proposed exclusions(RF+CW) in parent Index	Proposed			Existing		
		Emission Intensity Reduction(%)	Normalized Potential Emission Reduction (%)	ex ante Tracking Error (%)	Emission Intensity Reduction(%)	Normalized Potential Emission Reduction (%)	ex ante Tracking Error (%)
ACWI LOW CARBON LEADERS	3.70%	49.30%	53.80%	0.29%	50.00%	66.20%	0.24%
ACWI LOW CARBON TARGET	3.70%	81.10%	98.30%	0.30%	84.10%	99.00%	0.30%
EM LOW CARBON LEADERS	2.90%	57.80%	72.10%	0.78%	66.80%	75.80%	0.73%
EM LOW CARBON TARGET	2.90%	48.60%	85.10%	0.30%	74.10%	93.00%	0.30%
Japan LOW CARBON LEADERS	0.50%	59.60%	87.00%	0.57%	50.00%	87.40%	0.54%
Japan LOW CARBON TARGET	0.50%	76.30%	100.00%	0.30%	81.60%	100.00%	0.30%
Europe LOW CARBON LEADERS	3.90%	53.40%	85.00%	0.93%	53.90%	74.70%	0.72%
Europe LOW CARBON TARGET	3.90%	67.30%	76.20%	0.60%	59.60%	59.00%	0.30%
North America LOW CARBON LEADERS	4.30%	51.40%	55.40%	0.46%	50.00%	80.90%	0.45%
North America LOW CARBON TARGET	4.30%	58.30%	83.30%	0.30%	67.10%	94.90%	0.30%
USA LOW CARBON TARGET	4.40%	54.50%	72.60%	0.30%	64.30%	91.90%	0.30%

* Weights of security in Index as of Jun 01, 2017

PROPOSED ENHANCEMENTS TO THE SRI AND ESG LEADERS METHODOLOGIES

POTENTIAL USE CASES FOR ESG INDEXES WITH COMMON INSTITUTIONAL APPROACHES TO ESG INVESTING

INTEGRATION



Incorporate ESG criteria to enhance long term return, manage ESG financial risk

The MSCI ESG LEADERS INDEX is an example of an index used by investors looking to integrate ESG signals as a way to enhance long term return

VALUES



Align portfolio with investor's ethical or political values

IMPACT



Generate measurable social or environmental benefits as well as financial returns

The MSCI SRI INDEX is an example of an index used by investors looking to align their investments with their values and enhance long term return

SUMMARY OF PROPOSED CHANGES

- **MSCI SRI Indexes**
 - Enhancement to Values Based Exclusion (VBE) Screen
 - Addition of ESG Trend Factor

- **MSCI ESG Leaders**
 - Removal of Values Based Exclusion (VBE) Screen
 - Removal of ESG Rating buffer
 - Addition of ESG Trend Factor

PROPOSED ENHANCEMENTS TO SRI INDEXES

MSCI SRI INDEXES: VALUES BASED EXCLUSION SCREENS

MSCI IS PROPOSING TO ENHANCE THE VALUES BASED EXCLUSION SCREENS USED IN THE MSCI SRI INDEXES TO CLARIFY ITS OBJECTIVES, SIMPLIFY ITS DESIGN AND REFLECT THE LATEST CONSENSUS IN THE MARKET AROUND CONTROVERSIAL ACTIVITIES

ENHANCEMENTS TO VALUES BASED EXCLUSION (VBE) SCREEN

- ✓ The proposed changes will remove absolute thresholds and categorize activities based on the level of involvement
- ✓ The proposed changes will also add a screen on thermal coal



The rationale for both proposed changes is to simplify the methodology, align it with the new framework defined by ESG Research and reflect the latest trends in the market around controversial activities

MSCI SRI INDEXES: PROPOSED VALUES BASED SCREEN

- ESG Research has developed a framework designed to define significant involvement in controversial activities
- We are proposing to use this framework to help simplify the SRI methodology
- In addition, we are proposing to add a screen based on Coal mining (>30% revenue) to align with the common threshold in the market (e.g. NBIM, Allianz)

	Zero Tolerance	Minimal Tolerance	Low Tolerance
Unacceptable involvement (aka 'flag' or 'screen out')	<ul style="list-style-type: none"> • Any Tie or equivalent 	<ul style="list-style-type: none"> • Primary involvement = T (i.e. Revenue >0%) • Secondary involvement ≥5% aggregate* revenue • Certain secondary involvement with no revenue factors 	<ul style="list-style-type: none"> • Most controversial subset of primary involvement = T** • Primary involvement ≥5% revenue • Secondary involvement ≥15% revenue • Aggregate involvement ≥15% revenue
Proposed Values based screens for the SRI Index	<ul style="list-style-type: none"> • Controversial weapons 	<ul style="list-style-type: none"> • Nuclear weapons • Civilian firearms 	<ul style="list-style-type: none"> • Alcohol • Gambling • Tobacco • Conventional weapons • Adult Entertainment • GMO • Nuclear power

SIMULATED IMPACT - ENHANCED VBE SCREEN

- As of June 01, 2017, the enhanced VBE screen would have resulted in 42 companies being newly eligible, and nine companies being newly ineligible relative to the existing screen for the MSCI ACWI universe
- Simulated top new eligible companies

Security Name	Country Name	Weight in Parent ACWI	Prior Exclusion Reason
GENERAL ELECTRIC CO	USA	0.58%	Nuclear Power, Military Weapons
BERKSHIRE HATHAWAY B	USA	0.49%	Nuclear Power, Military Weapons
PEPSICO	USA	0.40%	Alcohol
WAL-MART STORES*	USA	0.29%	Civilian Firearms
BAYER	GERMANY	0.26%	GMO
BASF	GERMANY	0.21%	GMO
DOW CHEMICAL CO	USA	0.18%	GMO
BHP BILLITON (AU)*	AUSTRALIA	0.14%	Nuclear Power
RIO TINTO PLC (GB)	UNITED KINGDOM	0.12%	Nuclear Power
BHP BILLITON PLC (GB)*	UNITED KINGDOM	0.08%	Nuclear Power

* These companies would not be eligible if the proposal on exclusion of Worst Offenders (Controversial Weapons/Red Flag Screening) is implemented

- Simulated new ineligible companies (all resulting from the proposed Coal mining screen)

Security Name	Country Name	Weight in Parent ACWI	Exclusion Reason
CHINA SHENHUA ENERGY H	CHINA	0.02%	Coal Mining
UNITED TRACTORS	INDONESIA	0.01%	Coal Mining
COAL INDIA	INDIA	0.01%	Coal Mining
ADARO ENERGY PT	INDONESIA	0.00%	Coal Mining
EXXARO RESOURCES	SOUTH AFRICA	0.00%	Coal Mining
YANZHOU COAL MINING H	CHINA	0.00%	Coal Mining
DMCI HOLDINGS	PHILIPPINES	0.00%	Coal Mining
BANPU	THAILAND	0.00%	Coal Mining
CHINA COAL ENERGY H	CHINA	0.00%	Coal Mining

SIMULATED INDEX IMPACT - ENHANCED VBE SCREEN

- As of June 01, 2017, applying the enhanced VBE screen would have resulted in five of the newly eligible companies being added to the MSCI ACWI SRI Index, and four newly ineligible companies being deleted from the MSCI ACWI SRI Index
- Simulated index impact – new additions

Security Name	Country Name	Weight in Parent ACWI	Prior Exclusion Reason
PEPSICO	USA	0.40%	Alcohol
WHOLE FOODS MARKET	USA	0.03%	Alcohol
EDP ENERGIAS DE PORTUGAL	PORTUGAL	0.02%	Nuclear Energy
KIKKOMAN CORP	JAPAN	0.01%	Alcohol
COCA-COLA AMATIL	AUSTRALIA	0.01%	Alcohol

- Simulated index impact – new deletions

Security Name	Country Name	Weight in Parent ACWI	Exclusion Reason
UNITED TRACTORS	INDONESIA	0.01%	Coal Mining
ADARO ENERGY PT	INDONESIA	0.00%	Coal Mining
EXXARO RESOURCES	SOUTH AFRICA	0.00%	Coal Mining
BANPU	THAILAND	0.00%	Coal Mining

SIMULATED HISTORICAL INDEX IMPACT - ENHANCED VBE SCREENS FOR SRI INDEXES

- Comparison of ACWI SRI with old screen vs simulated ACWI SRI with new screen showed only a marginal difference in Risk and Return profile

Key Metrics			
	MSCI ACWI Index	MSCI ACWI SRI Index	Simulated MSCI ACWI SRI (Enhanced VBE Screen) Index
Total Return* (%)	6.2	7.4	7.4
Total Risk (%)	11.5	11.5	11.5
Return/Risk	0.54	0.64	0.65
Sharpe Ratio	0.50	0.61	0.61
Active Return (%)	0.0	1.2	1.2
Tracking Error (%)	0.0	1.3	1.4
Information Ratio		0.92	0.91
Historical Beta	1.00	0.99	0.99
No of Stocks***	2477	538	539
Turnover** (%)	2.8	19.3	19.1

Period: 28-Nov-2014 to 31-May-2017

* Gross returns annualized in USD

** Annualized one-way index turnover over index reviews

*** Monthly averages

QUESTIONS:

- *Do you agree with the proposed new screens?*
- *Do you think we should exclude other controversial activities(e.g. predatory lending) and/or change threshold?*

PROPOSED ENHANCEMENTS TO ESG LEADERS INDEXES

PROPOSED ENHANCEMENTS TO ESG LEADERS INDEXES

MSCI IS PROPOSING TO ENHANCE THE ESG LEADERS INDEX TO CLARIFY ITS OBJECTIVES AND ALIGN IT WITH THE ESG UNIVERSAL INDEX

1. REMOVAL OF VALUES BASED EXCLUSION (VBE) SCREENING

- ✓ The proposed change will remove values based exclusion BUT still exclude “Worst Offenders”. Note that the proposed Worst Offender exclusions were defined in the changes implemented to MSCI ESG Controversies by MSCI ESG Research

➡ *The rationale for the change is to clarify the objective of the index which is to mitigate ESG risks and enhance return in the long term*

2. REMOVAL OF ESG RATING BUFFER

- ✓ In the current methodology, an existing constituent is retained in the index as long as it is rated at B and above (on a scale of AAA-CCC). By dropping buffer, constituents with rating downgrade to B or below will necessarily be dropped from the index

➡ *The rationale for the proposed change is to avoid having the index exposed to stocks rated B which are categorized as laggards in the MSCI ESG Ratings framework*

PROPOSED REMOVAL OF VALUES BASED EXCLUSIONS FROM ESG LEADERS METHODOLOGY

SIMULATED IMPACT – REMOVAL OF VBE SCREEN

- The removal of VBE screen would have resulted in 109 companies being newly eligible relative to the existing screen for the MSCI ACWI universe as of June 01, 2017.
- Simulated top new eligible companies

Security Name	Country Name	Weight in Parent ACWI	Prior Exclusion Reason
GENERAL ELECTRIC CO	USA	0.58%	Nuclear Power, Military Weapons
BERKSHIRE HATHAWAY B	USA	0.49%	Military Weapons
PHILIP MORRIS INTL	USA	0.45%	Tobacco
ALTRIA GROUP	USA	0.35%	Tobacco
BRITISH AMERICAN TOBACCO	UNITED KINGDOM	0.32%	Tobacco
BOEING CO*	USA	0.26%	Military Weapons
HONEYWELL INTERNATIONAL	USA	0.23%	Nuclear Power, Military Weapons
UNITED TECHNOLOGIES CORP	USA	0.22%	Military Weapons
ANHEUSER-BUSCH INBEV	BELGIUM	0.21%	Alcohol
DIAGEO	UNITED KINGDOM	0.18%	Alcohol

* Boeing Co would not be eligible if the proposal on exclusion of Worst Offenders (Controversial Weapons/Red Flag Screening) is implemented

SIMULATED INDEX IMPACT – REMOVAL OF VBE SCREEN

- As of June 01, 2017, removing the VBE screen would have resulted in 27 of the newly eligible companies being added to the MSCI ACWI ESG Leaders Index.
- Simulated index impact – Top new additions

Security Name	Country Name	Weight in Parent ACWI	Prior Exclusion Reason
BERKSHIRE HATHAWAY B	USA	0.49%	Military Weapons
UNITED TECHNOLOGIES CORP	USA	0.22%	Military Weapons
ANHEUSER-BUSCH INBEV	BELGIUM	0.21%	Alcohol
NEXTERA ENERGY	USA	0.16%	Nuclear Power
RAYTHEON	USA	0.12%	Military Weapons
NORTHROP GRUMMAN CORP	USA	0.10%	Military Weapons
EXELON CORP	USA	0.08%	Nuclear Power
PERNOD RICARD	FRANCE	0.07%	Alcohol
AMBEV ON (NEW)	BRAZIL	0.07%	Alcohol
HEINEKEN NV	NETHERLANDS	0.05%	Alcohol

SIMULATED INDEX IMPACT - REMOVAL OF VBE SCREENS

- Comparison of MSCI ACWI ESG Leaders Index with VBE screen vs MSCI ACWI ESG Leaders Index with no VBE screen showed only a marginal difference in Risk and Return profile

Key Metrics			
	MSCI ACWI Index	MSCI ACWI ESG (VBE) Index	MSCI ACWI ESG (without VBE)Index
Total Return* (%)	18.1	16.8	16.9
Total Risk (%)	5.7	6.3	6.2
Return/Risk	3.21	2.66	2.72
Sharpe Ratio	3.10	2.57	2.62
Active Return (%)	0.0	-1.3	-1.3
Tracking Error (%)	0.0	1.2	1.1
Information Ratio		-1.07	-1.11
Historical Beta	1.00	1.10	1.08
No of Stocks***	2477	1308	1323
Turnover** (%)	2.7	6.6	6.5

Period: 31-May-2016 to 31-May-2017

* Gross returns annualized in USD

** Annualized one-way index turnover over index reviews

*** Monthly averages

QUESTIONS:

- *Do you agree with the proposal of removal of VBE screens from MSCI ESG Leaders Methodology?*

PROPOSED REMOVAL OF ESG RATING BUFFER FROM ESG LEADERS METHODOLOGY

SIMULATED IMPACT – REMOVAL OF ESG RATING BUFFER

- The removal of the ESG rating buffer during index construction would have resulted in 50 'B' rated securities being ineligible relative to the existing buffer rules for the MSCI ACWI universe as of June 01, 2017.
- Simulated top new ineligible companies

Security Name	Country Name	Weight in Parent ACWI	ESG Rating
US BANCORP	USA	0.208%	B
THERMO FISHER SCIENTIFIC	USA	0.165%	B
CHINA MOBILE	CHINA	0.164%	B
DANAHER CORP	USA	0.128%	B
EOG RESOURCES	USA	0.126%	B
FORD MOTOR CO	USA	0.099%	B
KINDER MORGAN P	USA	0.091%	B
CROWN CASTLE INTL CORP	USA	0.088%	B
INTERCONTINENTAL EXCH	USA	0.086%	B
BB&T CORP	USA	0.081%	B

SIMULATED INDEX IMPACT – REMOVAL OF ESG RATING BUFFER

- As of June 01, 2017, removing the ESG rating buffer would have resulted in 39 of the new ineligible companies being deleted from the MSCI ACWI ESG Leaders Index
- Simulated index impact – top new deletions

Security Name	Country Name	Weight in Parent ACWI	ESG Rating
US BANCORP	USA	0.208%	B
CHINA MOBILE	CHINA	0.164%	B
EOG RESOURCES	USA	0.126%	B
FORD MOTOR CO	USA	0.099%	B
KINDER MORGAN P	USA	0.091%	B
INTERCONTINENTAL EXCH	USA	0.086%	B
BB&T CORP	USA	0.081%	B
RELIANCE INDUSTRIES	INDIA	0.065%	B
WILLIAMS COS	USA	0.057%	B
CONCHO RESOURCES	USA	0.045%	B

- Simulated index impact – new additions

Security Name	Country Name	Weight	ESG Rating
L3 TECHNOLOGIES	USA	0.03%	BBB
HD SUPPLY HOLDINGS	USA	0.02%	BBB
MACY'S	USA	0.02%	BB
LEGGETT & PLATT	USA	0.02%	BB
TOLL BROTHERS	USA	0.01%	BB
TRIPADVISOR	USA	0.01%	BB
GRUPO AEROP PACIFICO B	MEXICO	0.01%	BB
PLDT	PHILIPPINES	0.01%	BB
TRUE CORP	THAILAND	0.00%	BBB
IDEA CELLULAR	INDIA	0.00%	BBB
LG UPLUS	KOREA	0.00%	BB
GLOBE TELECOM	PHILIPPINES	0.00%	BBB
KEPCO PLANT SVCS & ENGR	KOREA	0.00%	BB

HIGHLIGHTS - REMOVAL OF ESG RATING BUFFER

- The risk-return profile of MSCI ACWI ESG Leaders Index without the ESG rating buffer almost mirrored the risk-return profile of MSCI ACWI ESG Leaders Index with such buffer

Key Metrics			
	MSCI ACWI Index	MSCI ACWI ESG Buffer Index	MSCI ACWI ESG w/o Buffer Index
Total Return* (%)	6.2	6.8	6.7
Total Risk (%)	11.5	11.4	11.3
Return/Risk	0.54	0.60	0.60
Sharpe Ratio	0.50	0.57	0.56
Active Return (%)	0.0	0.7	0.5
Tracking Error (%)	0.0	1.1	1.0
Information Ratio		0.58	0.54
Historical Beta	1.00	0.98	0.98
No of Stocks***	2477	1349	1334
Turnover** (%)	2.8	14.5	16.3

Period: 28-Nov-2014 to 31-May-2017

* Gross returns annualized in USD

** Annualized one-way index turnover over index reviews

*** Monthly averages

QUESTIONS:

- Do you agree with the proposed removal of ESG rating buffer for the ESG Leaders Indexes?*

PROPOSED ADDITION OF THE ESG TREND FACTOR TO BOTH SRI AND ESG LEADERS METHODOLOGIES

PROPOSED ADDITION OF THE ESG TREND FACTOR

MSCI IS PROPOSING TO INTEGRATE THE ESG TREND FACTOR IN THE SELECTION CRITERIA

	PROPOSAL	ALTERNATIVE
DESCRIPTION	Within each ESG Rating group, stocks are preferred in order of Upgrade, Flat and Downgrade	Downgraded stocks in one Rating group and upgraded stocks from the immediately lower ESG Rating group are equally preferred
PREFERENCE ORDER	..., A+*, A=, A-, BBB+, BBB=, BBB-,...	AAA and AA+, AA=, AA- and A+, A=, A- and BBB+, BBB=, BBB- and BB+,...

 *The rationale for the change is increased exposure to potential future ESG leaders while maintaining a simple methodology*



PROPOSED CHANGES TO INDEX METHODOLOGY

	Proposal	Alternative
Eligibility hurdle	ESG Leaders - lowest category BB- ; SRI – lowest category: BBB-	
Ranking (in each GICS sector)	As per ‘Preference Order’ in Proposal	As per ‘Preference Order’ in Alternative
Tie Breakers	Ties are broken in order of <ol style="list-style-type: none"> a. Current index membership b. Industry Adjusted Score⁺ c. Market Capitalization Weight 	Ties are broken in order of <ol style="list-style-type: none"> a. Current index membership b. Market Capitalization Weight
Selection (within each GICS Sector) – Thresholds for ESG Leaders halved for SRI)	No change	<ol style="list-style-type: none"> 1. Securities in the top 35% cumul. cap 2. AAA, AA+, AA=, AA- and A+ stocks in top 25% cumul. cap 3. Current index constituents in the top 65% cumul. cap 4. Remaining securities
Sector Cap coverage	SRI – 25%, ESG Leaders – 50%	SRI – 25%, ESG Leader – 50%

QUESTIONS:

- *Are the rating eligibility hurdles appropriate for the ESG Leaders and SRI Indexes?*
- *Do you agree with the proposed handling of tiebreakers and selection order?*

POTENTIAL IMPACT OF PROPOSED CHANGES

The proposal would have resulted in higher exposure to companies with upward ratings trends while maintaining similar risk/return characteristics compared to the current indexes

- ✓ In a 5-year* performance attribution, the proposed indexes showed higher contribution to active return from asset selection effect.
 - Asset selection contribution to active return improved by almost 50 bps per annum for the SRI indexes
- ✓ Similar index composition between current and proposed indexes (80-90% of constituents are common).

➔ Proposed changes resulted in a reasonable level of turnover - Proposed SRI indexes exhibited about 18% turnover and ESG Leaders indexes about 14% turnover.

More details on the simulation are provided in the Appendix

QUESTION:

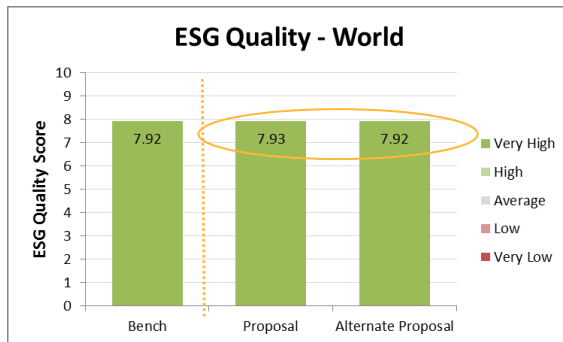
- *Given the modest impact, do you agree with MSCI's proposal to include the ESG trend factor?*

* Back test Period : 30th Nov 2012 to 31st July 2017

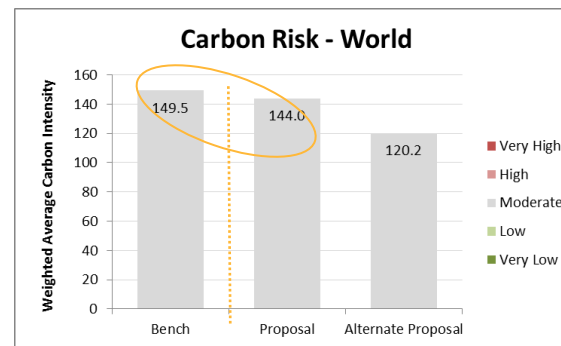
HIGHLIGHTING ESG CHARACTERISTICS –WORLD SRI

The ESG profile of the MSCI World-based simulations and differences with the existing index are illustrated below

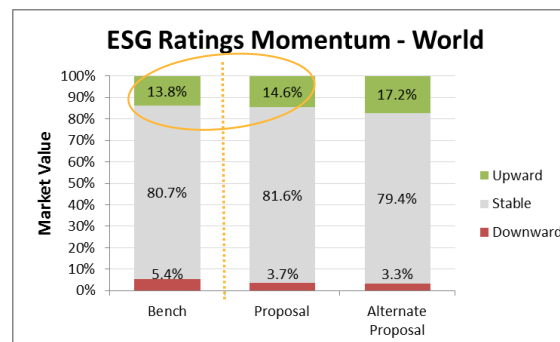
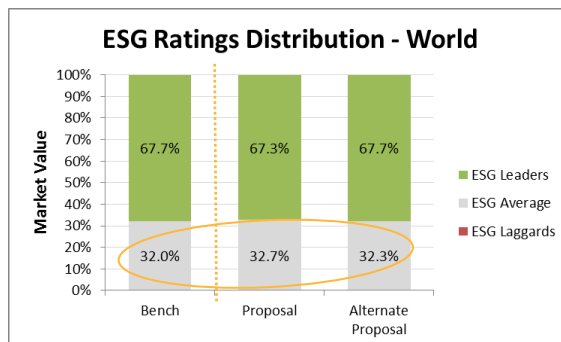
ESG quality across all options



Carbon footprint



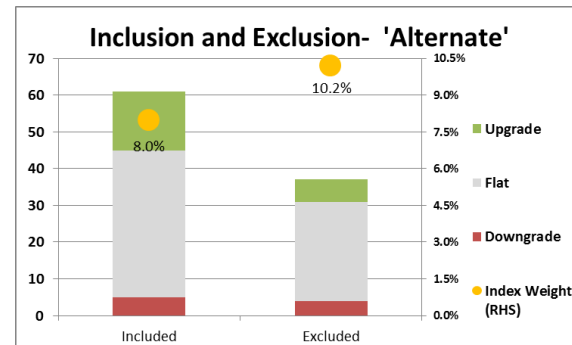
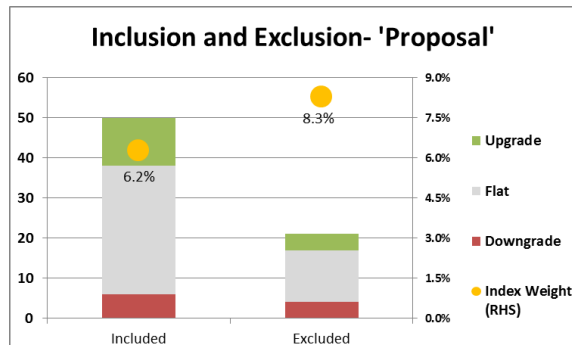
Exposure to Companies with an upward ESG Rating Trend



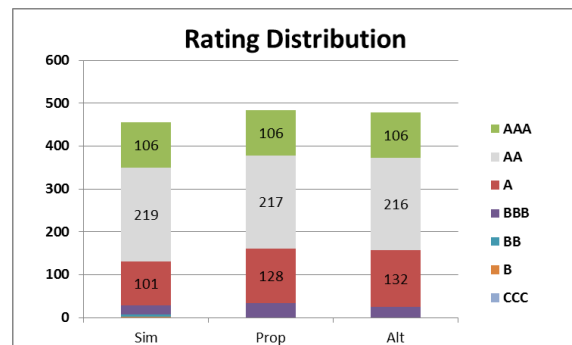
INCLUDED AND EXCLUDED CONSTITUENTS+ - WORLD SRI

The distribution of ESG and ESG Trend profile of the MSCI World-based simulations and differences with the existing index are illustrated below

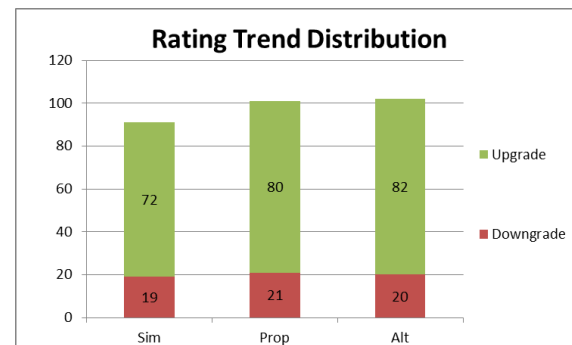
Both proposal differed from the current methodology (simulated) by only about 8% to 10%.



Inclusion of more A rated stocks



Inclusion of more 'upgrades'



+Index Transition Simulation

- Represents indexes which constructed if existing MSCI indexes were transitioned to the proposal as of 1st June 2017.
- In order to compare path dependent methodologies, the current constituents are kept fixed across all indexes.

*Sim : An SRI or ESG Leaders Index constructed as per the current methodology and uses MSCI regional index as parent

APPENDIX

WEAPON CATEGORY AND RELATED TREATY

Weapon Category	Convention / Treaty
Chemical Weapons	Chemical Weapons Convention
Biological Weapons	Biological Weapons Convention
Cluster Munitions	Cluster Munitions Convention
Landmines	Mine Ban Treaty
Weapons Utilizing Non-Detectable Fragments	Convention on Certain Conventional Weapons, Protocol I
White Phosphorous	Convention on Certain Conventional Weapons, Protocol III
Blinding Laser Weapons	Convention on Certain Conventional Weapons, Protocol IV
Nuclear Weapons	Nuclear Non-Proliferation Treaty
Depleted Uranium	N/A

HIGHLIGHTS – TOBACCO BASED EXCLUSION

- Impact of exclusion of tobacco companies from MSCI ACWI Index

Key Metrics		
	MSCI ACWI Index	MSCI ACWI ex Tobacco Index
Total Return* (%)	6.2	6.0
Total Risk (%)	11.5	11.5
Return/Risk	0.54	0.52
Sharpe Ratio	0.50	0.49
Active Return (%)	0.0	-0.1
Tracking Error (%)	0.0	0.2
Information Ratio		-0.75
Historical Beta	1.00	1.00
No of Stocks***	2477	2465
Turnover** (%)	2.8	2.8
Period: 28-Nov-2014 to 31-May-2017		
*Gross returns annualized in USD		
** Annualized one-way index turnover over index reviews, *** Monthly Averages		

- As of June 01, 2017 for MSCI ACWI Index, the following 12 companies would be excluded if Tobacco exclusion screen is applied on MSCI ACWI

Security Name	Country
PHILIP MORRIS INTL	USA
ALTRIA GROUP	USA
BRITISH AMERICAN TOBACCO	UNITED KINGDOM
REYNOLDS AMERICAN	USA
IMPERIAL BRANDS	UNITED KINGDOM
JAPAN TOBACCO	JAPAN
ITC	INDIA
KT&G CORP(KOREA TOBACCO)	KOREA
SWEDISH MATCH	SWEDEN
HM SAMPOERNA	INDONESIA
GUDANG GARAM	INDONESIA
BRITISH AMER TOBACCO MY	MALAYSIA

SIMULATED INDEX IMPACT– ESG RATING BUFFER FOR SRI INDEXES

- Existing Methodology: MSCI ACWI SRI Index with buffer: Existing constituent is retained in the index as long as the constituent is rated at or above BB
- MSCI ACWI SRI Index with reduced buffer: Existing constituent is retained in the index as long as the constituent is rated at or above BBB
- MSCI ACWI SRI Index with no buffer: Existing constituents with rating downgrade to BBB or below will necessarily be dropped from the index.
- Simulation results indicate that the sector coverage would have decreased and turnover would have increased if we move from buffer to reduced buffer to no buffer

Index	Current ACWI SRI*	ACWI SRI (Buffer)**	ACWI SRI (Reduced Buffer)**	ACWI SRI (No Buffer)**
Number of constituents	577	589	570	522
Adds w.r.t to ACWI SRI (buffer) index	-	-	7	18
Dels w.r.t to ACWI SRI (buffer) index	-	-	26	85
ACWI Sector Coverage	24.5%	24.9%	24.0%	21.7%
Turnover(%) w.r.t Current ACWI SRI	-	6.54%	9.04%	18.71%

* Current ACWI SRI as of May 31, 2017

** Rebalanced Simulations as of June 1 2017

PROPOSED HIERARCHY OF STOCKS WITHIN GROUPS

Proposal	Alternate Proposal
1. AAA	1. AAA or AA +
2. AA +	2. AA =
3. AA=	3. AA – or A+
4. AA –	4. A =
5. A+	5. A- or BBB+
6. A=	6. BBB =
7. A-	7. BBB- or BB+ (excluded in SRI)
8. BBB +	8. BB = (excluded in SRI)
9. BBB=	9. BB- (excluded in SRI)
10. BBB-	10. B or CCC excluded
11. BB+ (excluded in SRI)	
12. BB= (excluded in SRI)	
13. BB- (excluded in SRI)	
14. B or CCC excluded	

- In case of Alternate Proposal, if industry adjusted score is used as tie breaker then it will force for example - A+ stocks below AA- stocks in final ranking.
- Proposed methodology, using Alternate Proposal, does not use industry adjusted score to break ties.

ADDITION OF ESG TREND FACTOR: INCLUDED AND EXCLUDED CONSTITUENTS - MSCI WORLD INDEX

Stock inclusions show improvement to industry leaders and A rated stocks

1. Proposals differed from current by ~8% (SRI) and ~3% (ESG Leaders)
2. Greater net exposure to upgrades
3. Fewer downgrades, more A rated stocks.

		SRI*			ESG Leaders*		
		Sim	Prop	Alt	Sim	Prop	Alt
In Proposed Index but Out of Sim Index	Count		50	61		27	24
	Index Weight		6.2%	8.0%		2.4%	2.3%
	Upgrade		12	16		7	5
	Downgrade		6	5		1	1
Out of Proposed Index but In Sim Index	Count		21	37		30	45
	Index Weight		8.3%	10.2%		3.3%	3.6%
	Upgrade		4	6		3	7
	Downgrade		4	4		3	4
Constituents	Upgrade	72	80	82	133	139	133
	Downgrade	19	21	20	50	49	48
	AAA	106	106	106	113	113	113
	AA	219	217	216	252	252	252
	A	101	128	132	247	264	262
	BBB	22	33	25	188	189	173
	BB	6	0	0	53	47	47
	B	1	0	0	16	1	1
CCC	0	0	0	0	0	0	
Total		455	484	479	869	866	848
Transition Turnover		12.6%	18.5%	20.2%	6.5%	9.7%	10.0%

Index Transition Simulation

- Represents indexes which constructed if existing MSCI indexes were transitioned to the proposal as of 1st June 2017.

- In order to compare path dependent methodologies, the current constituents are kept fixed across all indexes.

*Sim : An SRI or ESG Leaders Index constructed as per the current methodology and uses MSCI regional index as parent

ADDITION OF ESG TREND FACTOR: SIMULATED[^] PERFORMANCE COMPARISON - MSCI WORLD INDEX

Key Metrics				
	MSCI World Index	World Sri Sim	World Sri Proposal	World Sri Alternate Proposal
Total Return* (%)	11.7	11.5	11.7	11.6
Total Risk (%)	10.2	10.7	10.5	10.6
Return/Risk	1.15	1.08	1.11	1.10
Sharpe Ratio	1.12	1.05	1.08	1.07
Active Return (%)	0.0	-0.2	-0.1	-0.2
Asset Selection Contribution		-0.6	-0.1	-0.1
Tracking Error (%)	0.0	1.9	1.9	2.0
Information Ratio	NaN	-0.10	-0.03	-0.08
Historical Beta	1.00	1.03	1.02	1.02
No of Stocks***	1629	492	575	550
Turnover** (%)	2.5	17.8	17.5	20.6
Price To Book***	2.1	2.2	2.2	2.2
Price to Earnings***	18.6	18.5	19.2	19.0
Dividend Yield*** (%)	2.5	2.6	2.5	2.5

Period: 30-Nov-2012 to 31-Jul-2017

* Gross returns annualized in USD

** Annualized one-way index turnover over index reviews

*** Monthly averages

The definitions of all statistical parameters are available in the Appendix

Key Metrics				
	MSCI World Index	World ESG Leaders Sim	World ESG Leaders Proposal	World ESG Leaders Alternate Proposal
Total Return* (%)	11.7	11.4	11.5	11.5
Total Risk (%)	10.2	10.5	10.5	10.5
Return/Risk	1.15	1.09	1.10	1.09
Sharpe Ratio	1.12	1.06	1.07	1.06
Active Return (%)	0.0	-0.3	-0.2	-0.3
Asset Selection Contribution		-0.49	-0.51	-0.56
Tracking Error (%)	0.0	1.4	1.4	1.4
Information Ratio	NaN	-0.23	-0.16	-0.19
Historical Beta	1.00	1.02	1.02	1.02
No of Stocks***	1629	1036	1019	1007
Turnover** (%)	2.5	12.5	14.0	14.4
Price To Book***	2.1	2.1	2.1	2.1
Price to Earnings***	18.6	19.6	19.4	19.4
Dividend Yield*** (%)	2.5	2.4	2.4	2.4

Period: 30-Nov-2012 to 31-Jul-2017

* Gross returns annualized in USD

** Annualized one-way index turnover over index reviews

*** Monthly averages

The definitions of all statistical parameters are available in the Appendix

*World Sri/ESG Leaders Sim : A World SRI/ESG Leaders Index constructed as per the current methodology using MSCI World as parent from 30th Nov 2012.

[^]Back test Period : 30th Nov 2012 to 31st July 2017

ADDITION OF ESG TREND FACTOR: ESG AND CARBON METRICS - MSCI WORLD INDEX

ESG Metrics				
	MSCI World Index	World Sri Sim	World Sri Proposal	World Sri Alternate Proposal
Integration				
Key Integration Metrics				
ESG Score	5.6	7.9	7.9	7.9
ESG Leaders (AAA-AA) (%)	23.0	66.3	66.2	65.7
ESG Laggards (B-CCC) (%)	13.2	0.2	0.0	0.0
ESG Trend Positive (%)	20.4	14.6	15.6	18.5
ESG Trend Negative (%)	7.5	6.3	3.3	3.3
ESG Pillars				
Environmental Score	5.6	6.6	6.5	6.6
Social Score	4.4	5.5	5.6	5.6
Governance Score	4.9	5.8	5.9	5.8
Key Governance Metrics				
Lack of Independent Board Majority (%)	10.2	10.3	10.0	9.2
Deviation from One Share One Vote (%)	23.1	27.2	24.4	24.8
No Female Directors (%)	5.4	3.9	3.8	3.4

Carbon Exposure				
	MSCI World Index	World Sri Sim	World Sri Proposal	World Sri Alternate Proposal
Carbon Emissions (t CO2e/\$M Invested)	130	98	96	81
Carbon Intensity (t CO2e/\$M Sales)	220	151	147	127
Wtd Avg Carbon Intensity (t CO2e/\$M Sales)	201	150	146	120
Potential Carbon Emissions (t CO2e/\$M Invested)	2216	2010	1589	1467
Coal Reserves (%)	0.8	0.1	0.1	0.1
Fossil Fuel Reserves (%)	5.8	4.6	4.0	3.9

As of 31-Jul-2017

The definitions of all statistical parameters are available in the Appendix

ESG Metrics				
	MSCI World Index	World ESG Leaders Sim	World ESG Leaders Proposal	World ESG Leaders Alternate Proposal
Integration				
Key Integration Metrics				
ESG Score	5.6	6.7	6.9	6.9
ESG Leaders (AAA-AA) (%)	23.0	39.1	40.1	39.9
ESG Laggards (B-CCC) (%)	13.2	2.3	0.1	0.1
ESG Trend Positive (%)	20.4	17.8	18.4	18.1
ESG Trend Negative (%)	7.5	7.5	6.5	6.5
ESG Pillars				
Environmental Score	5.6	6.1	6.2	6.2
Social Score	4.4	5.1	5.1	5.1
Governance Score	4.9	5.3	5.4	5.3
Key Governance Metrics				
Lack of Independent Board Majority (%)	10.2	13.0	12.7	12.1
Deviation from One Share One Vote (%)	23.1	22.4	22.6	23.9
No Female Directors (%)	5.4	6.0	5.8	5.4

Carbon Exposure				
	MSCI World Index	World ESG Leaders Sim	World ESG Leaders Proposal	World ESG Leaders Alternate Proposal
Carbon Emissions (t CO2e/\$M Invested)	130	120	115	112
Carbon Intensity (t CO2e/\$M Sales)	220	188	181	179
Wtd Avg Carbon Intensity (t CO2e/\$M Sales)	201	185	178	180
Potential Carbon Emissions (t CO2e/\$M Invested)	2216	2080	1919	1846
Coal Reserves (%)	0.8	0.5	0.5	0.4
Fossil Fuel Reserves (%)	5.8	4.6	3.9	3.8

As of 31-Jul-2017

The definitions of all statistical parameters are available in the Appendix

KEY METRICS DEFINITION

Key Metrics	Definition
Total Return	Annualized Total Return is a measure of gain or loss on the index.
Total Risk	Total Risk (also called Volatility) is a measure of index return dispersion. Annualized volatility is computed as the standard deviation of monthly index Total Returns.
Return/Risk	Return/Risk is the index return per unit of index risk, computed as the ratio of Total Return to Total Risk.
Sharpe Ratio	The Sharpe Ratio is computed as the ratio of index Excess Return to risk where Excess Return is the difference between the Total Index Return (annualized) and the corresponding risk-free rate.
Active Return	Active return is the Total Return of a factor index relative to its parent.
Tracking Error	Tracking Error (also called Active Risk) measures the dispersion of Active Returns between a factor index and its parent, and is calculated as the annualized standard deviation of Active Returns.
Information Ratio	Information Ratio measures Return/Risk in Active space, calculated as the ratio of Active Return to Tracking Error.
Historical Beta	Beta is a measure of the level of co-movement between a factor index and its parent.
Turnover	Turnover measures the percentage change in the composition of an index at each index rebalancing.
Price to Book Value	Total free-float adjusted market capitalization of the index divided by total free-float weighted book value of its constituents.
Price to Earnings	Total free-float adjusted market capitalization of the index divided by total free-float weighted earnings of its constituents.
Dividend Yield	Total free-float weighted annual dividends paid by index constituents divided by the total free-float adjusted market capitalization of the index.
Risk	Definition
Total Risk	Total Risk (also called Volatility) is a measure of index return dispersion. Annualized volatility is computed as the standard deviation of monthly index Total Returns.
Annualized Downside Deviation	Downside Deviation is computed as the annualized standard deviation of negative monthly Total Returns.
Sortino ratio	The Sortino Ratio is computed as the average Excess Return (above a specified Minimum Acceptable Return, MAR) per unit of Total Downside Risk.
95 percentile VaR	The <i>highest</i> index tail return with 95% confidence over the next month. Historical VaR computes this tail return measure using historical observations.
99 percentile VaR	The <i>highest</i> index tail return with 99% confidence over the next month.
Expected Shortfall @ 95%	Measures the <i>expected</i> index tail return with 95% confidence over the next 1 month. Historical Expected Shortfall computes this tail return measure using historical observations.
Expected Shortfall @ 99%	Measures the <i>expected</i> index tail return with 99% confidence over the next 1 month.
Maximum Drawdown	The maximum loss suffered over the entire period of analysis. It is the drop in Total Return suffered between the Index's global minimum and the previous Index maximum.
Maximum Drawdown period	The number of months over which the Maximum Drawdown occurred.
Skewness	Skewness is the third central moment of the Index's gross monthly Total Return distribution and measures the degree of asymmetry of this Return distribution.
Kurtosis	Kurtosis is the fourth central moment of the Index's Total Return distribution and measures the peakedness of the return distribution.

KEY METRICS DEFINITION

Relative Risk		Definition
Tracking Error	Tracking Error (also called Active Risk) measures the dispersion of Active Returns between a factor index and its parent, and is calculated as the annualized standard deviation of Active Returns.	
Maximum Drawdown of Active Returns	Measures the maximum Drawdown of Active Returns.	
Maximum Drawdown of Active Returns Period	The number of months over which the Maximum Drawdown of Active Returns occurred.	
Fundamental Ratios and Valuation Metrics		Definition
Price to Book Value	At an index level P/BV is calculated using shareholders' equity available at the latest period end date, weighted by the constituent's free-float market capitalization.	
Price to Earnings	At an index level P/E is calculated using net income from the continuing operations available to all equity shareholders for each constituent, weighted by the constituent's free-float market capitalization.	
Price to Cash Earnings	At an index level P/CE is calculated using earnings, as stated above, including depreciation and amortization as reported by the company. This is then free-float market capitalization weighted.	
Price to Sales	At an index level P/S is calculated using 12-month trailing Sales (defined as net operating revenues from all on-going lines of business of the company). This is then free-float market capitalisation weighted.	
Dividend Yield (%)	At an index level, Dividend Yield is the annualised (last 12 months) gross regular cash dividend per share of each constituent, divided by its latest price, weighted by its free-float market capitalisation.	
Long Term Forward EPS Growth Rate (%)	At an index level, the Long-Term Forward EPS Growth is the weighted average of the consensus of analysts' earnings growth rate estimates for each constituent, typically provided for the next 3 to 5 years.	
Sustainable Growth Rate (%)	Calculated as $\text{Index Return on Equity} \times (1 - \text{Index Dividend Yield} \times \text{Index Price to Earnings})$	
Leverage	Leverage is the sum of the most recent book value of common equity plus preferred equity plus long-term debt, divided by book value of common equity. This is free-float market capitalization weighted.	
Return on Equity (%)	Return on equity at an index level, calculated using the index earnings divided by the index book value.	
Concentration Metrics		Definition
Average Number of Stocks	Average of number of stocks in the index over each rebalancing date.	
Effective Number of Stocks	Effective number of stocks (EN) is a measure of Index concentration and ranges between 1 (for a single stock) and the number of stocks in the Index (for an equal-weighted index). Generally, the lower the EN, the more concentrated an Index.	
Market Capitalization coverage	Market Cap Coverage measures the total Free Float Market Capitalization, in the parent index, of stocks which are constituents of the factor index.	
Top 10 Security weight	Top 10 Security Weight is a measure of portfolio concentration and calculated as the cumulative weight of the 10 highest weight securities in the index.	

KEY METRICS DEFINITION

Capacity Metrics		Definition
Capacity/Stock ownership	The proportion of the Free-Float/Full Market Capitalization of a stock held in a fund perfectly replicating an index, relative to the Free-Float/Full Market Capitalization of the stock, assuming US\$ 10bn AUM.	
Average	Average capacity of a stock in the index.	
Tail Average @ 95%	Average Capacity of all stocks that have capacity greater than the 95 th percentile.	
Maximum	Highest Capacity measure of any stock in the index.	
Active Tilt Metrics		Definition
Active Share	Active Share measures the degree of Active tilt of the factor index. Mathematically, it is the one-way turnover that will be incurred in shifting from the parent to the factor index.	
Average weight multiplier	Weight multiplier is a ratio of the weight of a security in the strategy index to its weight in the parent index indicating the number of times a stock is overweight or underweight. The average across all stocks in the index gives the average weight multiplier.	
Maximum weight multiplier	Maximum of the WM across all stocks in the index.	
Maximum Strategy Weight	Maximum stock weight in the index.	
Liquidity Metrics		Definition
Weighted Average ATVR	ATVR (Annual Traded Value Ratio) provides a measure of trading volume in a security as a proportion of market capitalization. The weighted average ATVR then measures this liquidity at the Index level.	
Days to trade	Days to Trade is the number of days required to trade a change in a stock position given its average trading volume. Calculated for the changes required for regular rebalancing, for initial set-up starting from the parent index and for initial set-up starting from cash. We assume \$10bn size and 10% ATV limit.	
Weighted Average	Summation of stock weight in index times the days to trade changes in stock position.	
Tail Average @ 95%	Average Days to Trade of all stocks that have Days to Trade greater than the 95 th percentile.	
Maximum	Maximum Days to Trade of any stock in the index.	
Days to complete 95% trading	Number of days required in order to complete 95% of the changes in stock positions	
Cost of Replication Metrics		Definition
Turnover	Annualized average of one-way Index turnover over all rebalancings.	
Performance Drag	Performance Drag is computed as the total transaction cost incurred as a result of tracking the index assuming linear, proportional, transaction costs. Calculated for 25/50/75 bps transaction costs.	

KEY METRICS DEFINITION

ESG Metrics	Definition
ESG Score	The ESG Score indicates how well the index companies manage their most material ESG risks relative to sector peers. Scores range from 10 (best) to 0 (worst).
ESG Leaders (AAA-AA) (%)	Exposure to companies with an ESG rating of AAA or AA (best in class relative to peers).
ESG Laggards (B-CCC) (%)	Exposure to companies with an ESG rating of B or CCC (worst in class relative to peers).
ESG Trend Positive (%)	Exposure to companies with a rating upgrade in the year prior to the most recent ESG rating.
ESG Trend Negative (%)	Exposure to companies with a rating downgrade in the year prior to the most recent ESG rating.
Environmental Score	The Environmental Score indicates how well the index companies manage their most material environment risks. Scores range from 10 (best) to 0 (worst).
Social Score	The Social Score indicates how well the index companies manage their most material social risks. Scores range from 10 (best) to 0 (worst).
Governance Score	The Governance Score indicates how well the index companies manage their most material governance risks. Scores range from 10 (best) to 0 (worst).
Lack of Independent Board Majority (%)	Exposure to companies lacking an independent board majority.
Deviation from One Share One Vote (%)	Exposure to companies flagged for limitations on voting rights.
No Female Directors (%)	Exposure to companies with no female directors.
Tobacco Producers (%)	Exposure to tobacco producers.
Ties to Controversial Weapons (%)	Exposure to companies with ties to controversial weapons.
Global Compact Compliance Violation or Watch List (%)	Exposure to companies in violation of the UN Global Compact principles, or on MSCI's "Watch List" for potential violations.
Red Flag Controversies (%)	Exposure to companies with very severe customer, environment, governance, human rights, or labor controversies.
Orange Flag Controversies (%)	Exposure to companies with serious customer, environment, governance, human rights, or labor controversies.
Carbon Exposure	Definition
Carbon Emissions	Carbon emissions normalized for the size of the portfolio tracking the index. (Unit: tons of CO2/ million \$ invested)
Carbon Emissions Intensity*	Efficiency of a portfolio tracking the index in terms of total carbon emissions divided by total sales. (Unit: tons of CO2/ million \$ of sales)
Weighted Average Carbon Intensity	Exposure to carbon intensive companies. (Unit: tons of CO2/ million \$ of sales)
Potential Carbon Emissions*	Carbon potential emissions normalized for the size of the portfolio tracking the index. (Unit: tons of CO2/ million \$ invested)
Coal Reserves (%)	Exposure to companies that own coal reserves.
Fossil Fuel Reserves (%)	Exposure to companies that own fossil fuel reserves

KEY METRICS DEFINITION

FACTOR FAMILY CALCULATIONS

Factor family exposures are calculated as a weighted average of the underlying factor exposures. The tables below provide the weights used for each model.

GEM2

Factor Name	Factor Family	Weight
Value	Value	1
Size	Size	0.8
Mid Cap	Size	-0.2
Momentum	Momentum	1
Volatility	Volatility	1
Leverage	Quality	1
Growth	Growth	1
Liquidity	Liquidity	1

GEM3

Factor Name	Factor Family	Weight
BtoP	Value	0.4
Earn. Yield	Value	0.6
Size	Size	0.8
Mid Cap	Size	-0.2
Momentum	Momentum	1
Beta	Volatility	0.6
Res. Vol.	Volatility	0.4
Leverage	Quality	1
Div. Yield	Yield	1
Growth	Growth	1
Liquidity	Liquidity	1

GEMLT

Factor Name	Factor Family	Weight
BtoP	Value	0.35
Earn. Yield	Value	0.45
LT Reversal	Value	0.2
Size	Size	0.8
Mid Cap	Size	-0.2
Momentum	Momentum	1
Beta	Volatility	0.6
Res. Vol.	Volatility	0.4
Leverage	Quality	-0.1
Earn. Qlty	Quality	0.25
Inv. Qlty	Quality	0.25
Profitability	Quality	0.25
Earn. Var.	Quality	-0.15
Div. Yield	Yield	1
Growth	Growth	1
Liquidity	Liquidity	1

USSLOW

Factor Name	Factor Family	Weight
Value	Value	0.35
Earn. Yield	Value	0.45
LT Reversal	Value	0.2
Size	Size	0.8
Mid Cap	Size	-0.2
Momentum	Momentum	0.85
Prospect	Momentum	-0.15
Beta	Volatility	0.6
Res. Vol.	Volatility	0.4
Mgmt. Qlty	Quality	0.3
Leverage	Quality	-0.1
Profitability	Quality	0.3
Earn. Qlty	Quality	0.3
Div. Yield	Yield	1
Growth	Growth	1
Liquidity	Liquidity	1

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