

DATA IS POTENTIAL

Measuring Seagate's Chemical Footprint

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Staff Program/Project Manager
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5 December 2017

MAXIMIZING DATA'S POTENTIAL

Measuring Seagate's Chemical Footprint

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Staff Program/Project Manager, Product Sustainability and Compliance

Seagate Technology

5 December 2017



Seagate is a Digital Storage
Company

Global Operations and Technology

Operational Excellence



Seagate Global Presence



- Waterloo, Canada
- Beaverton, OR, USA
- Fremont, CA, USA
- Cupertino, CA, USA
- Valencia, CA, USA
- Longmont, CO, USA
- Colorado Springs, CO, USA
- Oklahoma City, OK, USA
- Shakopee, MN, USA
- Bloomington, MN, USA
- Rochester, MN, USA
- Houston, TX, USA
- Round Rock, TX, USA
- Guadalajara, Mexico
- São Paulo, Brazil
- Danderyd, Sweden
- Dublin, Ireland
- Springtown, N. Ireland
- Paris, France
- Havant, UK
- Maidenhead, UK
- Munich, Germany
- Amsterdam, Netherlands
- Moscow, Russia
- Korat, Thailand
- Teparuk, Thailand
- Johor, Malaysia
- Penang, Malaysia
- Shugart, Singapore
- Woodlands, Singapore
- Sydney, Australia
- New Delhi, India
- Pune, India
- Bangalore, India
- Beijing, China
- Tokyo, Japan
- Taipei, Taiwan
- Hong Kong, China
- Wuxi, China
- Shenzhen, China
- Chengdu, China
- Shanghai, China
- Tianjin, China

Legend:

HQs, Admin/Sales	Design	Manufacturing	Customer Support
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Seagate Business Continuity Planning

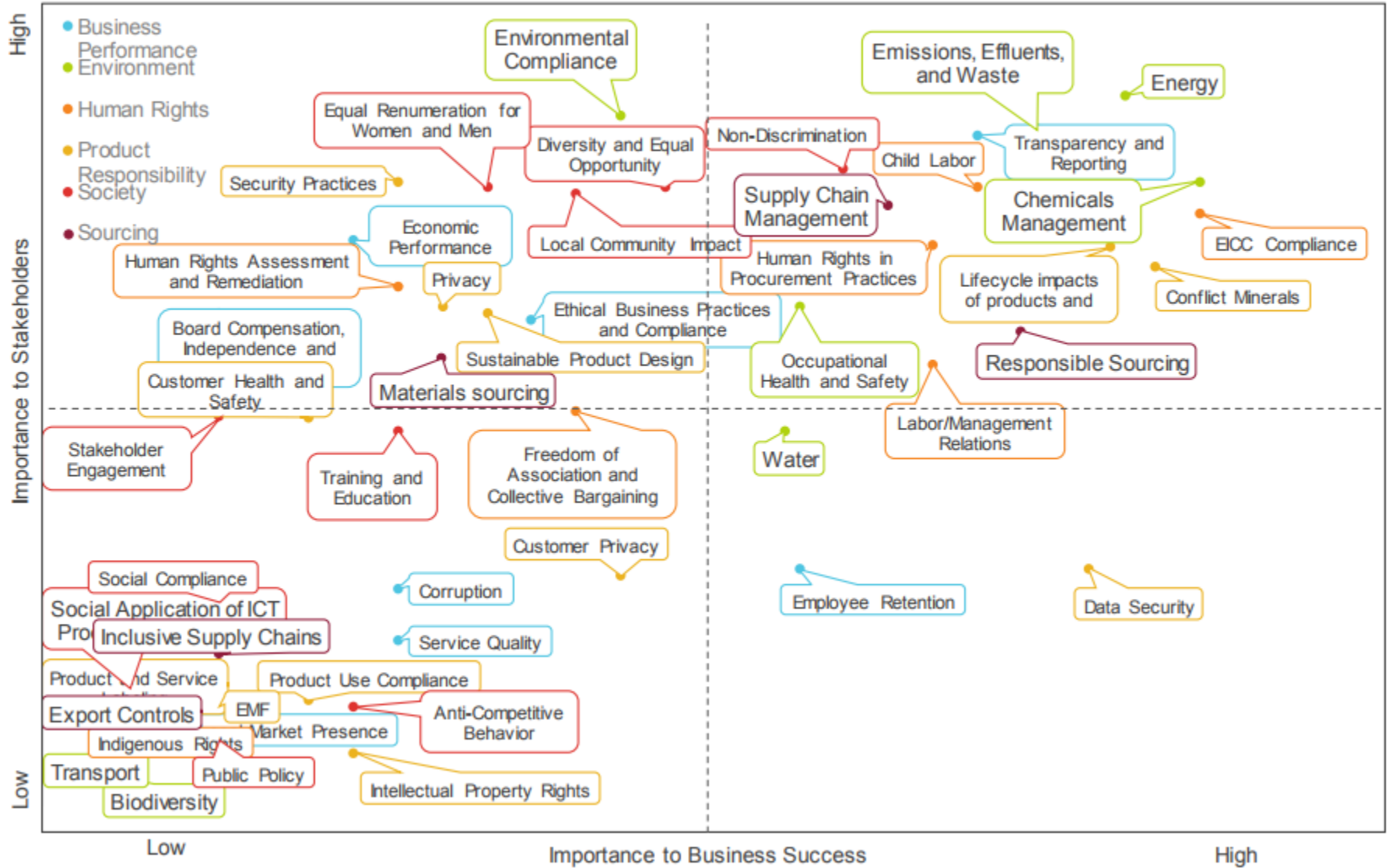
Operational Resilience in all Foreseeable Circumstances



Seagate Sustainability



Draft Materiality Assessment Results



Comprehensive Sustainability

Sustainability at Seagate Encompasses Three Aspects

Sustainability:

Meeting the needs of the present without compromising the ability of future generations to meet their own needs.



Seagate's Sustainability Priorities

Analyze, report, and reduce impacts across Seagate's operations and product portfolio



PRODUCT AND OPERATIONAL SUSTAINABILITY

Continuous Streams of Data that are Always On



COMPLIANCE

Evaluate and ensure compliance with the EICC's Code of Conduct, with committed non-regulatory standards, and all regulations of geographies in which Seagate does business



EMPLOYEE ENGAGEMENT

Create an environment encouraging and supporting employees' participation in sustainability endeavors



Seagate Sustainability Highlights

Expertise, Authenticity, Humility and Transparency Assures our Credibility and our Message

Bill of Substances

Publishing select bills of substances offers product material content transparency while protecting suppliers' confidentiality.

Full Materials Disclosure (FMD)

With over a decade's experience with product FMD, Seagate is designing and implementing its second generation FMD, and introducing its automated Conflict Minerals and Process Chemistry management tools.

Electronic Industry Citizenship Coalition

Commitment to the EICC Code of Conduct and the standards on social, environmental and ethical issues in the electronics industry.

United Nations Global Compact

Commitment to the UNGC and the ten universally accepted principles on human rights, labor, environment and anti-corruption.

Life Cycle Analysis (LCA)

Seagate publicly posts product and packaging LCA results, and actively engages in customer and stakeholder discussions sharing results and the data.

Supply Chain

Seagate actively engages with our Supply Chain partners in driving sustainable business practices throughout the supply chain.

Global Citizenship Annual Report

Annual publically available report on governance and ethics, product and environmental sustainability, employees, supply chain and community engagement.

Regulatory Compliance

Seagate management systems and programs support compliance to local regulatory requirements.



Seagate Supply Chain Awards and Recognition

Leading the Industry



Ranked by Gartner for Supply Chain Excellence

#16

of all Supply Chains (2015)

#7

of High Tech Industry (2014)

#20

of all Supply Chains (2014)

#4

in EMEA (2014)

First and only HDD Supply Chain to be recognized by Gartner



Ranked by Supply Chain Management World

#5 of 77

Breakthrough Supply Chains (2014)



Ranked by Supply Chain Insights

Top 4

Industrial Supply Chains to Admire (2014)



Seagate Supply Chain has been benchmarked **BY MORE THAN 20 FORTUNE 500 COMPANIES**. Companies use our processes as a standard of reference



Sustainability Awards and Recognition

Leading the Industry



HPE 2016 Corporate
Responsibility
Achievement Award



Acer 2015 CSR
Partnership Award



Highlighted in BizNGO's
Guide to Safer Chemicals for
Full Materials Disclosure



Huawei 2014 Green
Partner Certification



Seagate Sustainability and associated processes has been highlighted by **CUSTOMERS,**
NON-GOVERNMENTAL ORGANIZATIONS (NGOs), and **REGULATORS**



Seagate's Compliance Assurance System

Compliance Assurance System (CAS) History



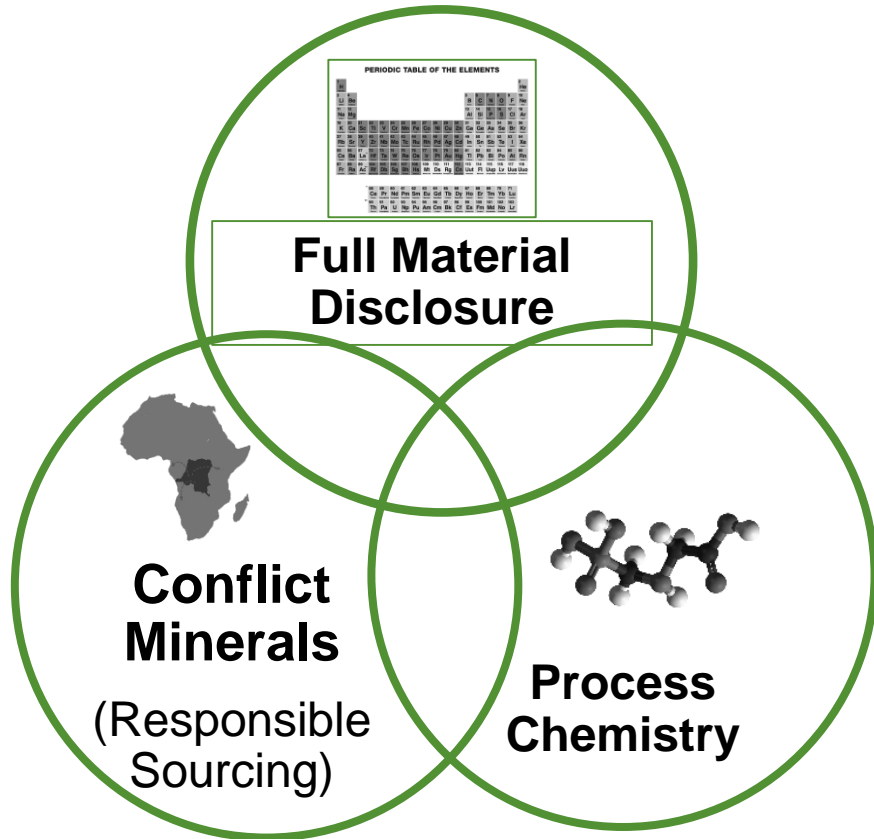
CAS: Full Materials Disclosure (FMD)

10,000 requests per year

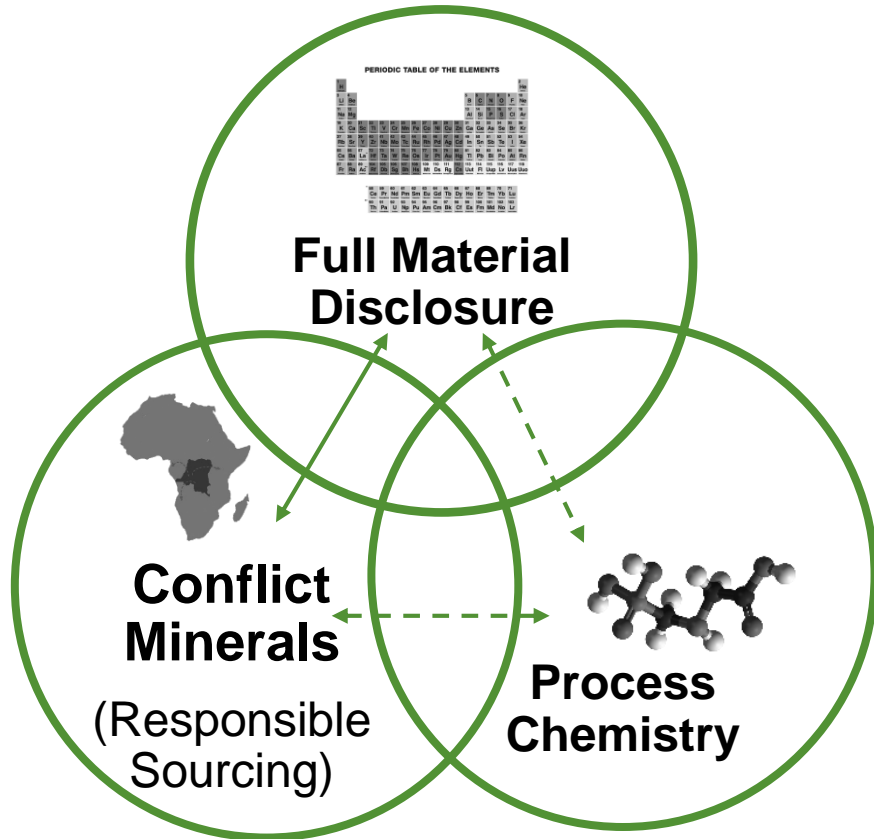
Conflict Minerals (3TG) on different system

CAS2 launched February 14

Integrates all areas into one tool



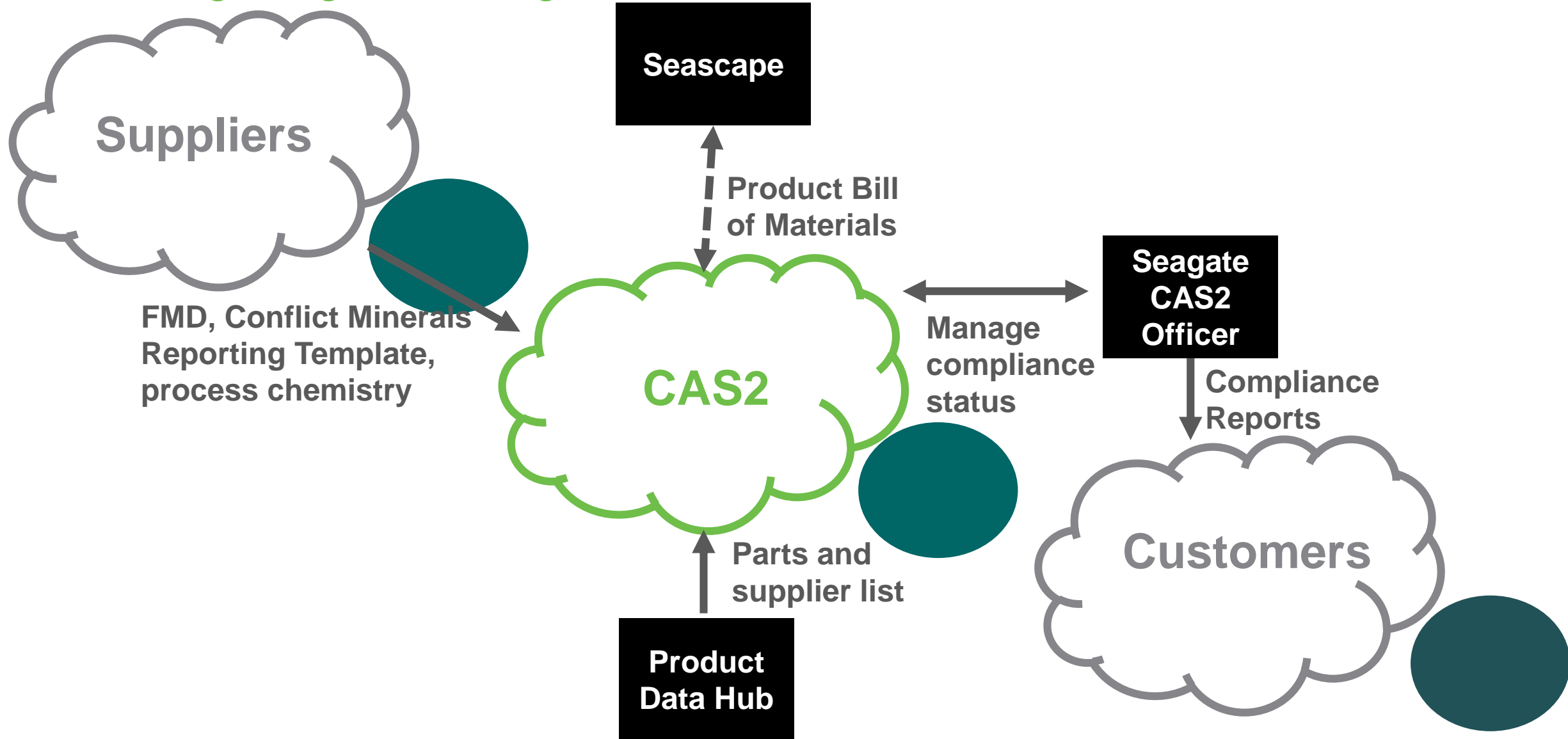
Introducing CAS2... An Industry First



All follow common workflow
Automates entire process
15,000+ active Seagate parts
30K supplier parts
Rigorous assessment of data
Process chemistry industry first



Solving Tough Challenges




FMD – IPC1752A format

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</Contact>
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</RequestCompany>
</Request>
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</BusinessInfo>
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  - <Sectional name="MaterialInfo">
    <SubSectional name="D"/>
  </Sectional>
</Include>
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            - <Substance name="Polyvinyl chloride">
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        </SubstanceCategoryList>
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            - <Substance name="Diethylhexylphthalate">
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Conflict Minerals Reporting Template (CMRT)

 <p>An initiative of the EICC and GeSI</p> <p>Select Language Preference Here: 選擇你的語言: 사용할 언어를 선택하십시오: 表示言語をここから選択してください: Sélectionner la langue préférée ici: Seleccione Preferéncia de idioma Aquí: Wählen sie hier die Sprache: Selecione el lenguaje de preferencia aquí: Selezionare la lingua di preferenza qui: Burada Dil Tercihini Belirleğin:</p>	<h2>Conflict Minerals Reporting Template (CMRT)</h2>	
	<p>English</p>	
<p>The purpose of this document is to collect sourcing information on tin, tantalum, tungsten and gold used in products Revision 5.01 June 21, 2017</p> <p style="text-align: right;">Link to Terms & Conditions</p>		
<p>Mandatory fields are noted with an asterisk (*). Consult the instructions tab for guidance on how to answer each question.</p>		
<p>Company Information</p>		
<p>Company Name (*):</p>		
<p>Declaration Scope or Class (*):</p>		
<p>Description of Scope:</p>		
<p>Company Unique ID:</p>		
<p>Company Unique ID Authority:</p>		
<p>Address:</p>		
<p>Contact Name (*):</p>		
<p>Email – Contact (*):</p>		
<p>Phone – Contact (*):</p>		

Process Chemistry Template

Copy of V2 ProChem declaration example -ex 3 media 1004422533.xls [Compatibility Mode] - Excel

William L. Olson

MRPRO(TM) Date collection for process chemicals by chemical categories version 3.02 Dated 3 March 2016

MRPRO(TM) Date collection for process chemicals by chemical categories version 3.02 Dated 3 March 2016												
Process Chemicals- Substances Used in Process of Manufacture, but not in Final Product												
SubProduct			Chemical Category				Substances / Chemicals					
Subproduct	Subproduct	Process	Category or group		Amount per	UOM(default	Chemical			Concentration	Substance Use	
Item Name	Number	Name	name	Material Name	subproduct	mg)	Name	CAS #	EC #	(mass %)	Description	
Media	100448995	sputter depo:	Other, not in this li	finished disk blank	1	ea	Ni plated alumir	9003-35-4		95	substrate	
Media	100448995	sputter depo:	Reagent	sputter target-FePt			Iron	7439-89-6		1.9	sputter	
Media	100448995	sputter depo:	Reagent	sputter target-FePt			Platinum	7440-06-4		0.1	sputter	
Media	100448995	sputter depo:	Gases	Argon			Argon	7440-37-1		3	sputter gas	
Media	100448995	lube applicati	Lubricants	Perfluoropolyether	50	ml	PFPE	69991-67-9		10	lubricant	
Media	100448995	lube applicati	Solvents	Vertrel™			Vertrel™	138495-42-8		90	lube solvent	

Gen_Info Proc_chem Family of Parts

READY COUNT: 10 120%



CALCULATING SEAGATE'S CHEMICAL FOOTPRINT

The CoHC Count Method

Our FMD system makes this a possible

Full Materials Disclosure (FMD)

With over a decade's experience with product FMD, Seagate is designing and implementing its second generation FMD, and introducing its automated Conflict Minerals and Process Chemistry management tools.

- Evaluate CoHCs against FMD database
- How did Bill do this? How will Joanne do this?
- Count the number of unique CASRN to arrive at Seagate's Chemical Footprint
- Mass-based calculation: pilot with one representative product



The Total Mass Method

Mapping our product sales to CoHC supplier disclosures

Approach:

Map product ST Models from our FMD system to substances, multiply substance mass in each PN by total number of each ST Model number shipped.

Current Challenges:

Hundreds of product ST Model numbers present mapping challenges between product lines and CoHCs. Next year we will perform the Total Mass Method on a single product/product line/line of business.



The Power of Seagate's Compliance Assurance System, 'CAS2'

Segment of 'Item Report' generated for FMD:

Assembly Number	Seagate Part Number	Item Description	Item Compliance Status	Part Category	Part Quantity	Quantity UoM	Mfr Name	Mfr Part Number	Qualification Status	Corporate Spec (Full) Status	Corporate Spec (Non-LH) Status	MP Mass
2811	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2812	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2813	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2814	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2815	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2816	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2817	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2818	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2819	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82
2820	ST10000NM0016	726057500	ASSY_MTR/BASE,MACHINED,B8,TATSU	Missing Info	ProductAssembly	1 EA		726057500	APPROVED,B-FULL QUALIFICATION	Compliant with Exemptions	Compliant with Exemptions	309.82

Report Filters	
Item Qualification Status	[APPROVED,A-APPROVED, APPROVED,B-FULL QUALIFICATION, APPROVED,C-EXACT TESTING, APPROVED,D-SPECIFIC, APPROVED,E-CONDITIONAL APPROVAL, APPROVED,S-SIMILAR TO
Compliance Status	[Compliant, Compliant with
Predominant	Yes



FMD 'item report' specificity of data, basis for mass-based CFP reporting

	S	T	U	V	W	X	Y	Z	AA	AB	AC
13	Material Amount in Part (%)	Total Mass of Each Material in Each Part	Substance Name	CAS Number	Substance Concentration in each Material (%)	Substance Mass in each Material (g)	Exemption	Total Mass of Each Substance in Each Subpart	Total Mass of Each Substance in Each Part	Substance Mass in each Material Multiplied by Part Quantity	Total Mass of Each Substance in Each Part Multiplied by Part Quantity
2811	2.14317991		SI	7440-21-3	0.3	0.01992		0.01992		0.01992	
2812	2.14317991		CHROMIUM	7440-47-3	19	1.2616		1.2616		1.2616	
2813	2.14317991		SULFUR, HOMOPOLYMER	9035-99-8	0.3	0.01992		0.01992		0.01992	
2814	0.00161384	0.005	LEAD	7439-92-1	0.0139	0.0000007		0.0000007		0.0000007	
2815	0.00161384		SN	7440-31-5	94.9861	0.0047493		0.0047493		0.0047493	
2816	0.00161384		COPPER (METALLIC)	7440-50-8	5	0.00025		0.00025		0.00025	
2817	0.0071009	0.022	LEAD	7439-92-1	0.0074	0.00000163		0.00000163		0.00000163	
2818	0.0071009		AG	7440-22-4	0.3	0.000066		0.000066		0.000066	
2819	0.0071009		SN	7440-31-5	96.9926	0.02133837		0.02133837		0.02133837	
2820	0.0071009		COPPER (METALLIC)	7440-50-8	2.7	0.000594		0.000594		0.000594	
2821	0.00064554	0.002	COLOPHONY	8050-09-7	100	0.002		0.002	0.002	0.002	0.002
2822	0.0161384	0.05	ARALDITE GY 250	25068-38-6	50	0.025		0.025		0.025	
2823	0.0161384		IMIDAZOLE	288-32-4	4.9735	0.00248675		0.00248675	0.00248675	0.00248675	0.00248675
2824	0.0161384		CALCIUM-CARBONATE	471-34-1	45	0.0225		0.0225	0.0225	0.0225	0.0225



Business Value of CFP



CFP Business Value to Seagate

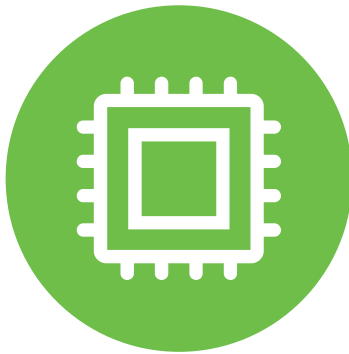
Building Industry Focus on Responsible Chemical Management

- Market and regulatory requirements drive Seagate's priorities
- Investor focus underpins internal chemical management initiatives
- Objective measurement allows tracking and improvement
- Provides a communication tool to our stakeholders
- Fosters support for materiality priorities:
 - Chemical Management
 - Supply Chain Management
 - Occupational Health and Safety
 - Emissions, Effluents, and Waste
 - Responsible Sourcing
 - Conflict Minerals
 - Transparency and Reporting

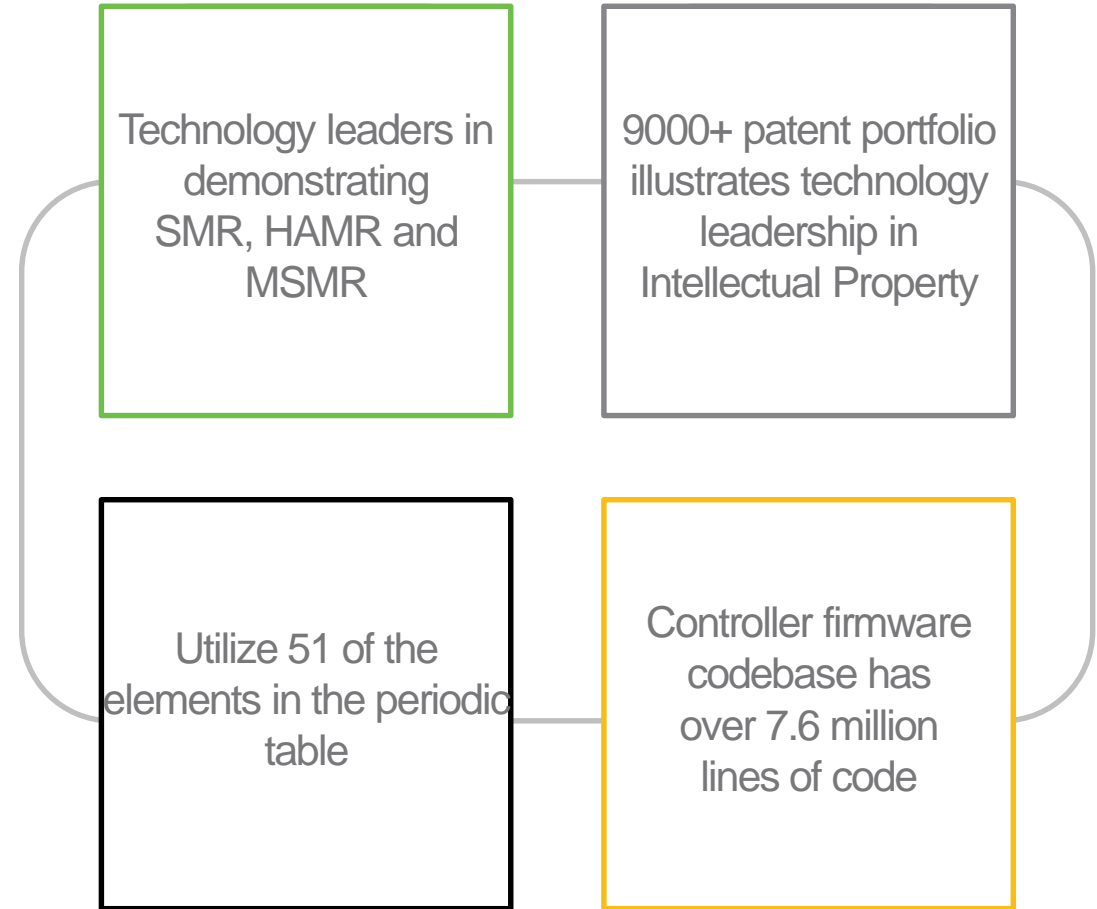


Operational Excellence - Design Overview

Leadership Through the Design of World Class Technologies

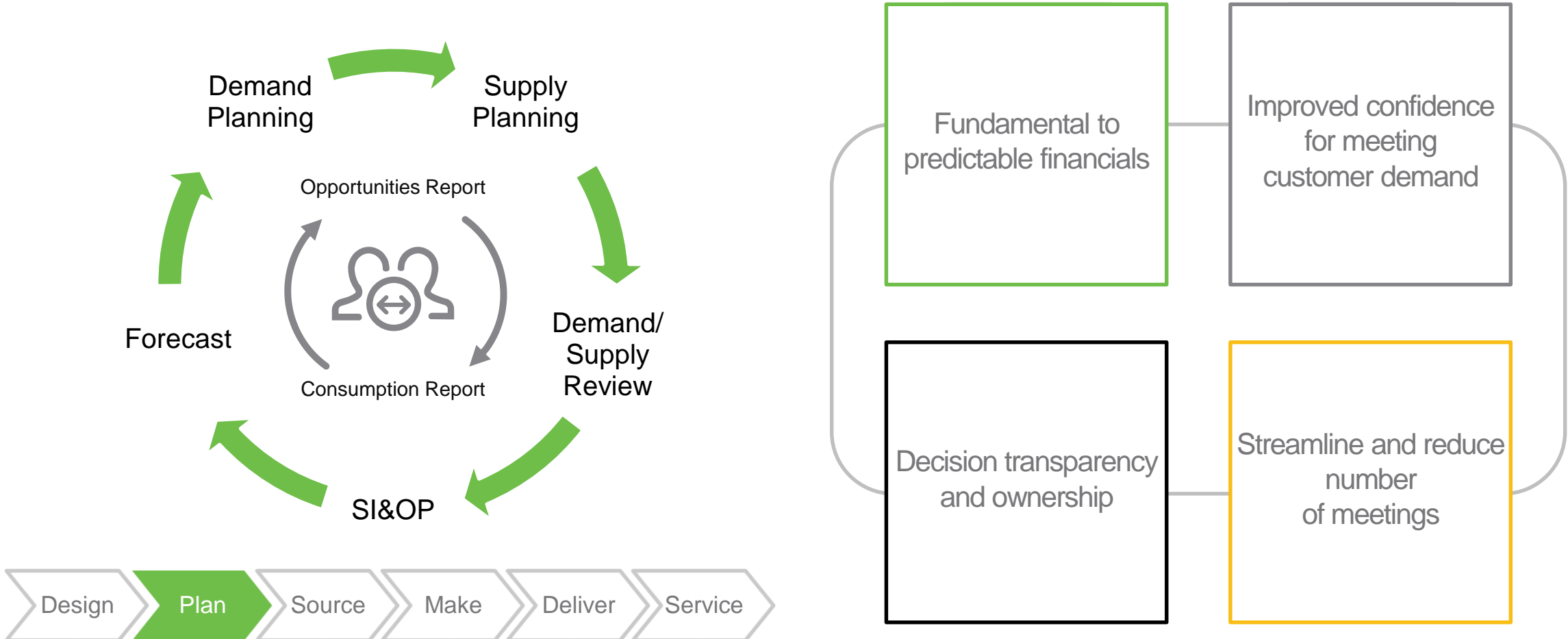


Vertical integration of design strategy favors technology advancements, data management and application tuning.



Operational Excellence — Plan Overview

Sales, Inventory, and Operations Planning (SI-OP)

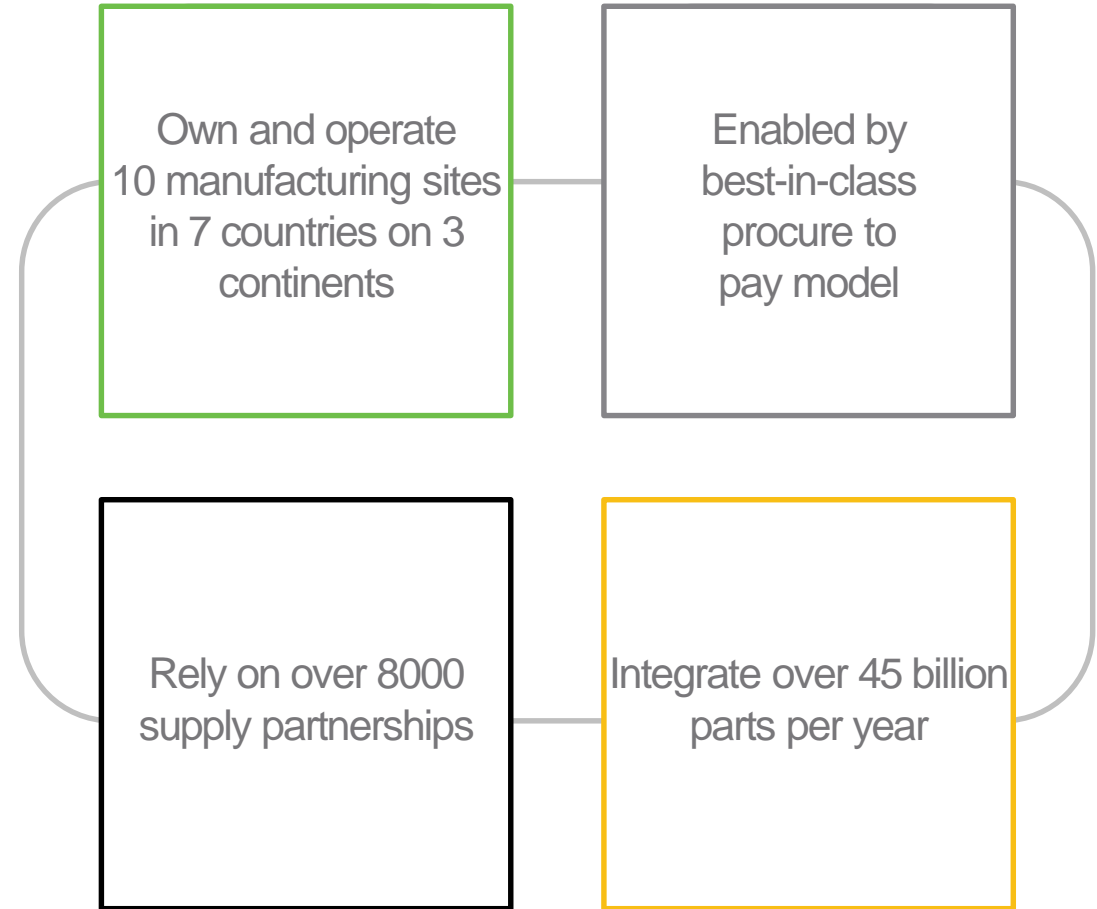


Operational Excellence — Source Overview

A Supply Chain that Balances Suppliers, Logistics, Risk, Cost and Quality



Integrated Supply Chain Enables Efficient, Sustainable Operation Across Device and System

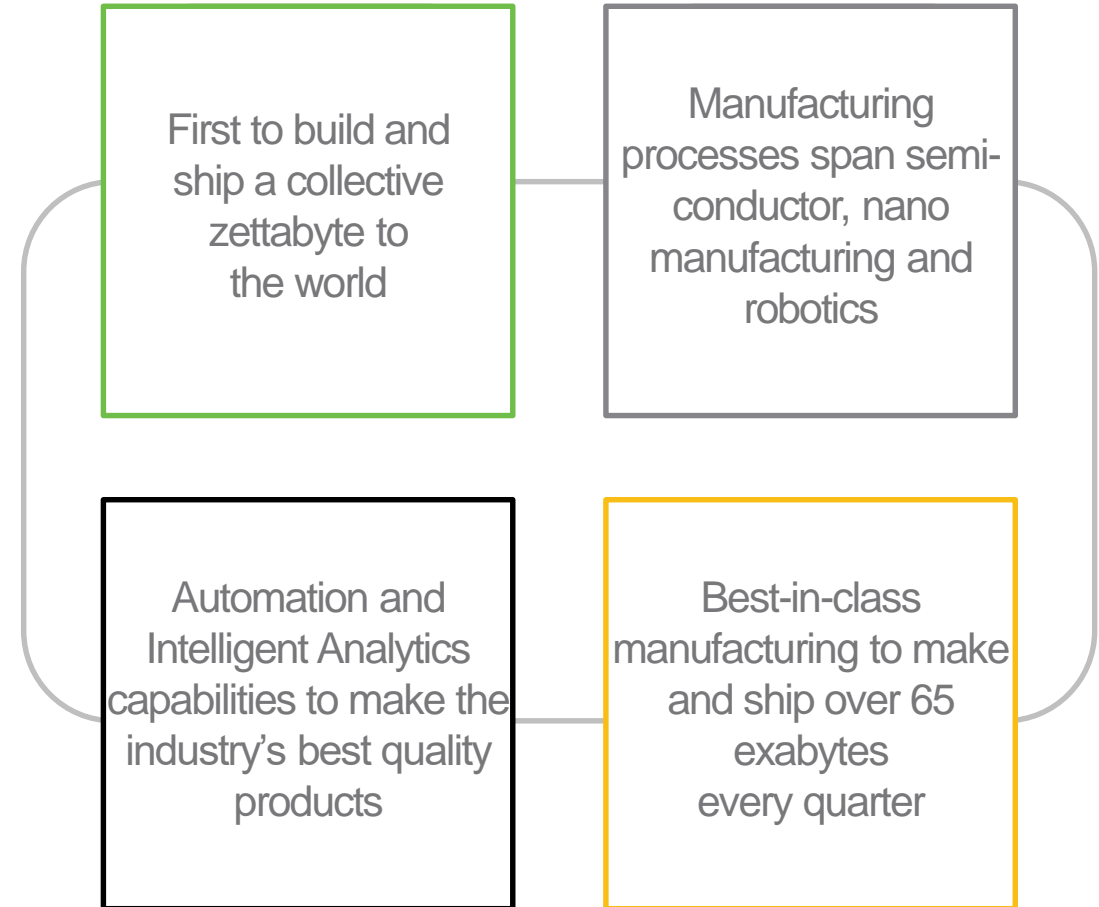


Operational Excellence — Make Overview

Make Best Quality Storage Products for the Human Experience



Be The Best HDD and Systems Manufacturer Rated by Customers for our product quality, technical excellence and innovative solutions.



Operational Excellence — Deliver Overview

Improving How We Serve Our Customers with Delivery



Seagate Aims for Perfect Order Delivery

- Ensure perfect order delivery to customers against their demand each and every time
- In full, on time, in perfect condition and accurate



Operational Excellence - Service Overview

Seagate Services Focuses on Customer Success

OPERATIONAL EFFICIENCY

Highest priority is integration quality and field reliability is excellence with our OEMs, Partners

REDEFINE HOW DATA RECOVERY IS OFFERED

10 worldwide recovery services locations provide > 80% recovery rate

LEVERAGE SEAGATE'S STORAGE EXPERTISE

More than 3,000 daily customer service contacts through phone, email



Seagate's Materiality Assessment

Project Objective, Outcomes and Impacts

Project Objective: Conduct a materiality assessment to identify, confirm, and prioritize issues that are most important to business success and stakeholders, with specific focus on understanding the management of these issues.

Project Outcomes

More Clarity

- Identification of priority sustainability issues—for achievement of business strategy and sustainability
- Clear understanding of sustainability trends and stakeholder priorities

More Alignment

- Shared understanding by relevant functions and business leaders on potential sustainability priorities
- Consistency between reporting and strategy
- Alignment of 2017 GCAR with new GRI Standards



Project Impacts

- Resource and support projects and programs that have the most measurable, positive impact on society and the environment, while ensuring Seagate's long-term success and differentiation from competitors
- Focus sustainability strategy, reporting, and stakeholder engagement efforts on opportunities for greatest impact on global challenges (such as climate change), and where stakeholder expectations are highest



Reading the Materiality Map

The prioritization matrix is divided into four quadrants to help guide the business approach to addressing each topic. The position of each topic represents its relative importance to stakeholders and the business.



Issue Breakdown: Overall

Overall, the primary issues most relevant to business success are of high importance to stakeholders. Seagate should develop a strategy to implement relevant initiatives to address the material issues within its operations and across its supply chain.

Key Themes / Narratives

- The top 10 issues greatly align with the top priorities of stakeholders, which will provide impactful once integrated into an updated CSR strategy
- Seagate should consider how the **material issue prioritization will change** in importance over time given the expansion and closing of manufacturing sites, Seagate's new strategy, and the transition to more cloud based products
- Identify the **internal tools and procedures** that will aid in measuring impact and progress in context of the material issues, and what **tools and policies** will be most effective for engaging with suppliers

Top 10 Issues

1. Energy
2. Chemicals Management
3. EICC Compliance
4. Emissions, Effluents, and Waste
5. Transparency and Reporting
6. Conflict Minerals
7. Lifecycle impacts of products and services
8. Child Labor
9. Non-Discrimination
10. Supply Chain Management

Bottom 10 Issues

1. Biodiversity
2. Transport
3. Local Market Presence
4. Public Policy
5. Export Controls
6. Social Application of ICT Products and Services
7. Indigenous Rights
8. EMF
9. Product and Service Labeling
10. Intellectual Property Rights



Thank You

