

Green Chemistry Education Webinar

**In Pursuit of Green Chemistry:
Perspectives on Careers in Industry**



March 11th, 2015



What is NESSE?

- International network of early-career sustainable scientists and engineers
- Connecting researchers across disciplines to work towards a sustainable future



To learn more, visit

www.sustainablescientists.org

Today's Speakers

Cory Robertson



Environmental Chemist
Hewlett-Packard

Kristi Budzinski



Green Chemistry/
BioPharma Program
Manager
Genentech

Drummond Lawson



Environmental Chemist
Arc'teryx



Green Chemistry @hp

In Pursuit of Green Chemistry: Perspectives on Careers in Industry

Cory Robertson

March 2015

My Path to Green Chemistry

- Started out as an analytical chemist working in the lab
- Performed analysis to support environmental teams
- Noticed the growing environmental requirements
- Completed Master's in Environmental Policy and Management
- Transitioned to working on environmental materials management full-time.



Why Is HP Interested in Green Chemistry?

Why do companies exist?

“I think many people assume, wrongly, that a company exists simply to make money. While this is an important result of a company’s existence, we have to go deeper and find the real reasons for our being. As we investigate this, we inevitably come to the conclusion that a group of people get together and exist as an institution that we call a company so that they are able to accomplish something collectively that they could not accomplish separately – they **make a contribution to society**, a phrase which sounds trite but is fundamental.”

David Packard

Co-founder of Hewlett Packard Company



75
YEARS

Make it matter



RoHS

The Law That Changed Everything

EU 2006

Lead (Pb)

Mercury (Hg)

Cadmium (Cd)

Hexavalent Chromium (Cr⁶⁺)

Polybrominated Biphenyls (PBB)

Polybrominated Diphenyl Ethers
(PBDE)



Logo from companion regulation
Waste Electrical and Electronic Equipment
(WEEE) Directive

RoHS

The Law That Changed Everything

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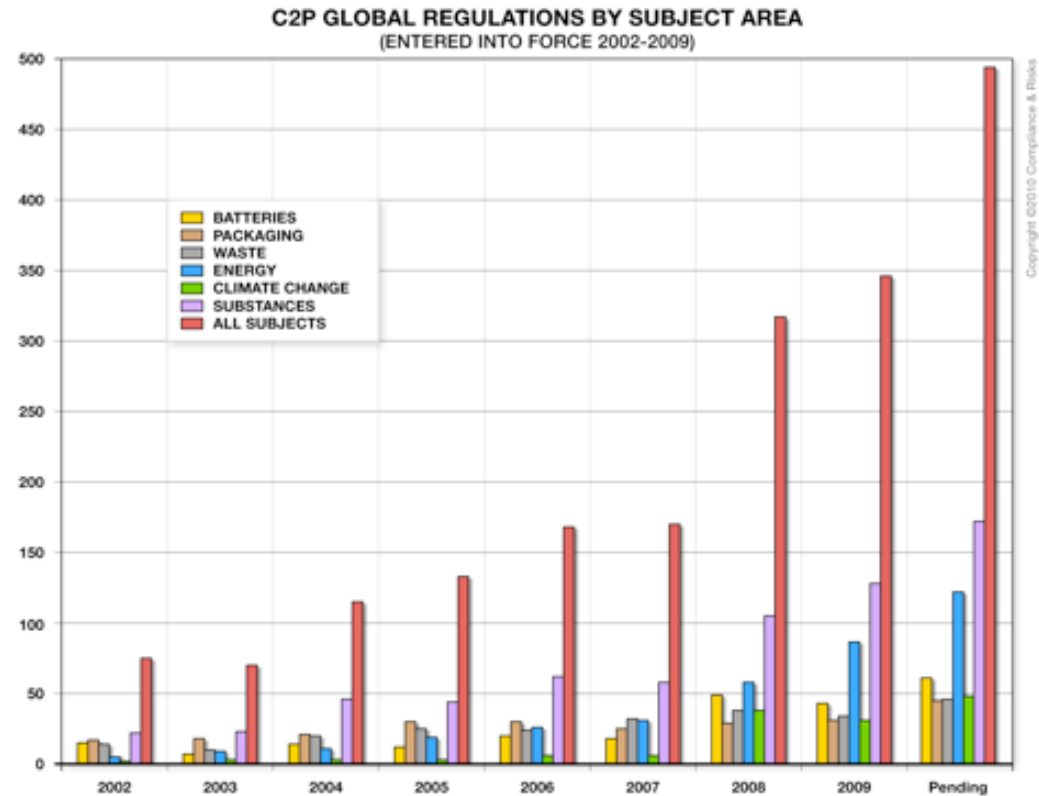
Logo from companion regulation
Waste Electrical and Electronic Equipment
(WEEE) Directive

Are the alternatives better?

More Regulations Coming

Substance restrictions have become a major class of regulation for finished electronic products

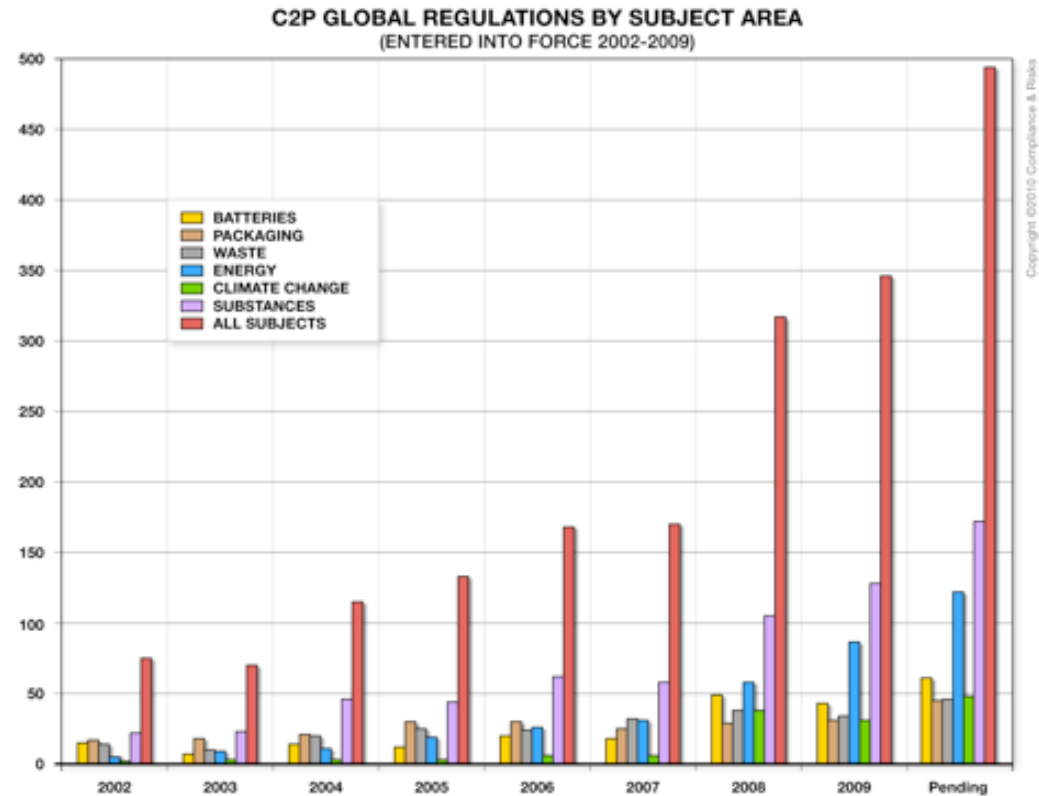
- More substances
- More jurisdictions
- More reporting



More Regulations Coming

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- More substances
- More jurisdictions
- More reporting

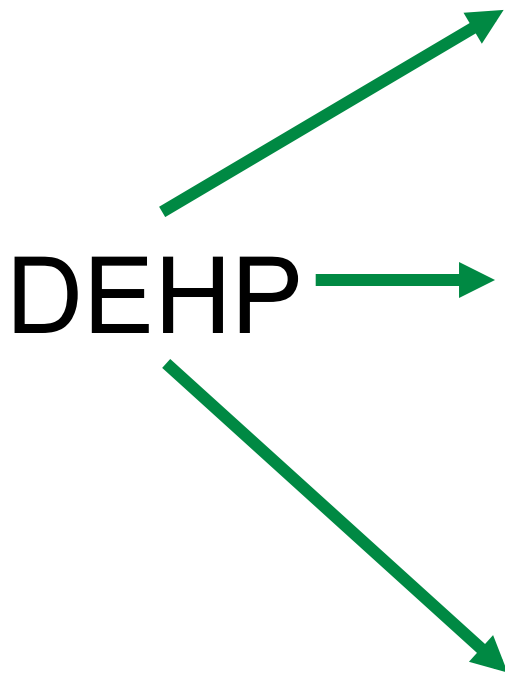


HP wants to use materials no one cares about

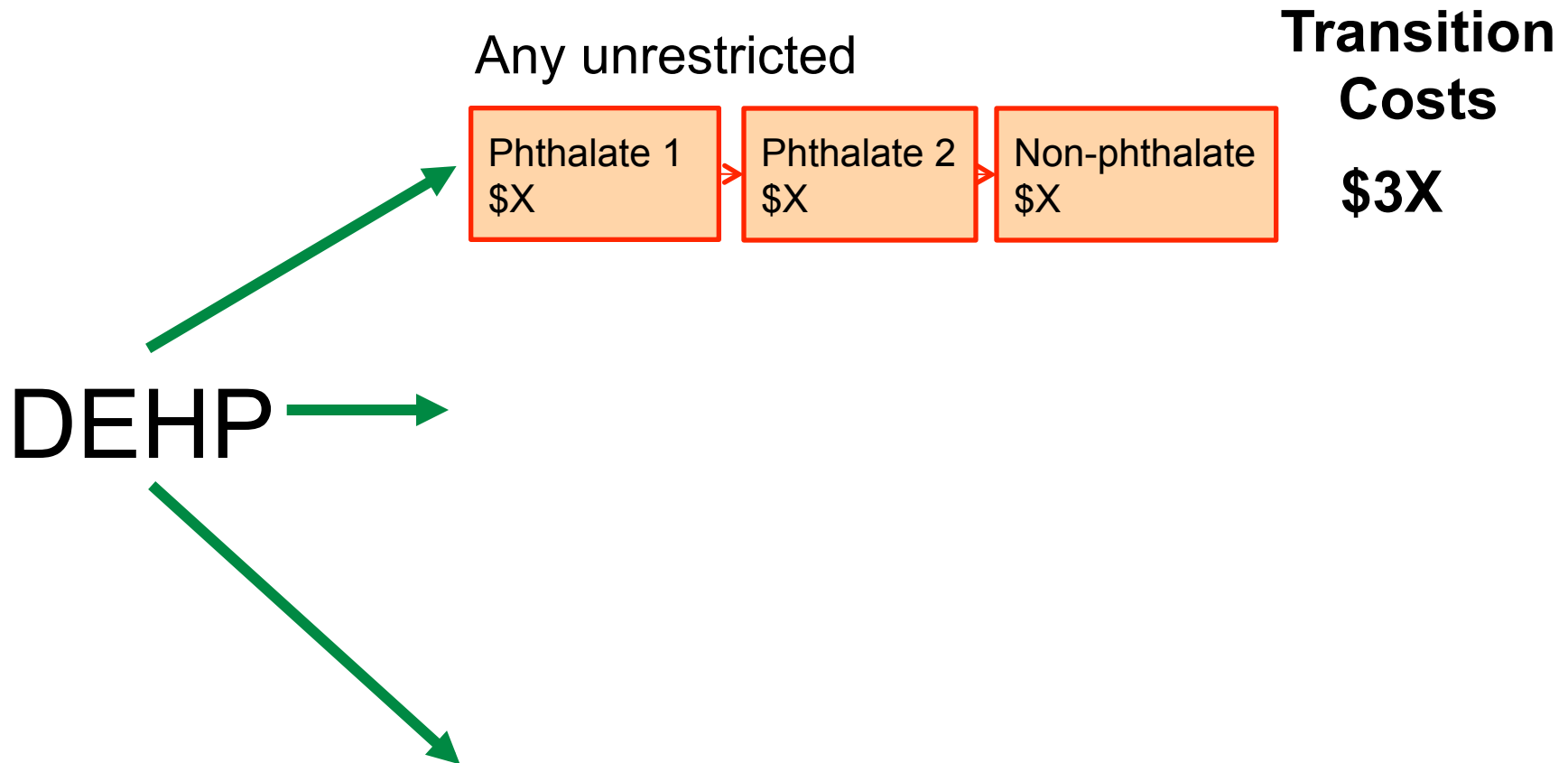


Avoiding extra substitutions saves money

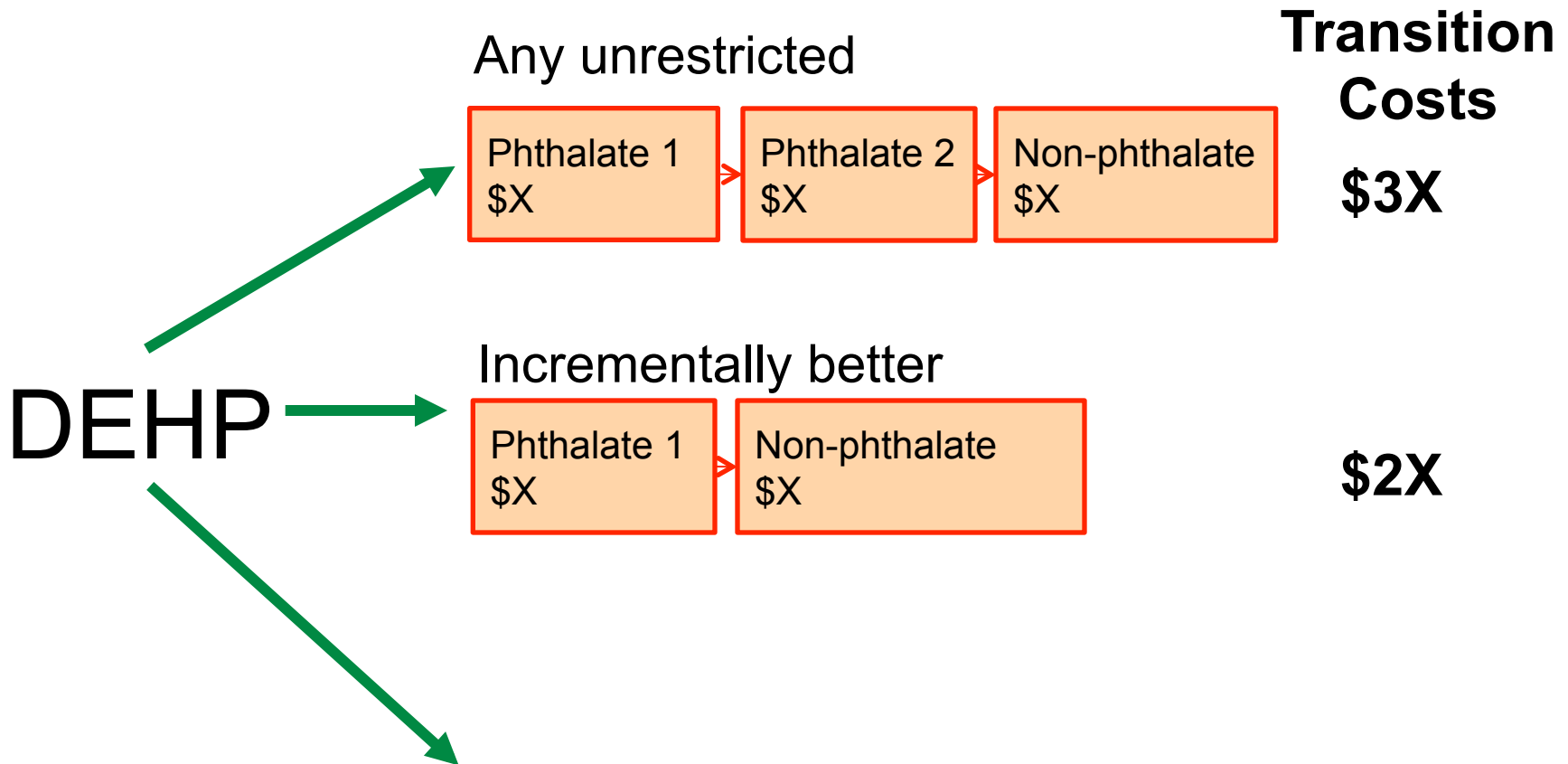
**Transition
Costs**



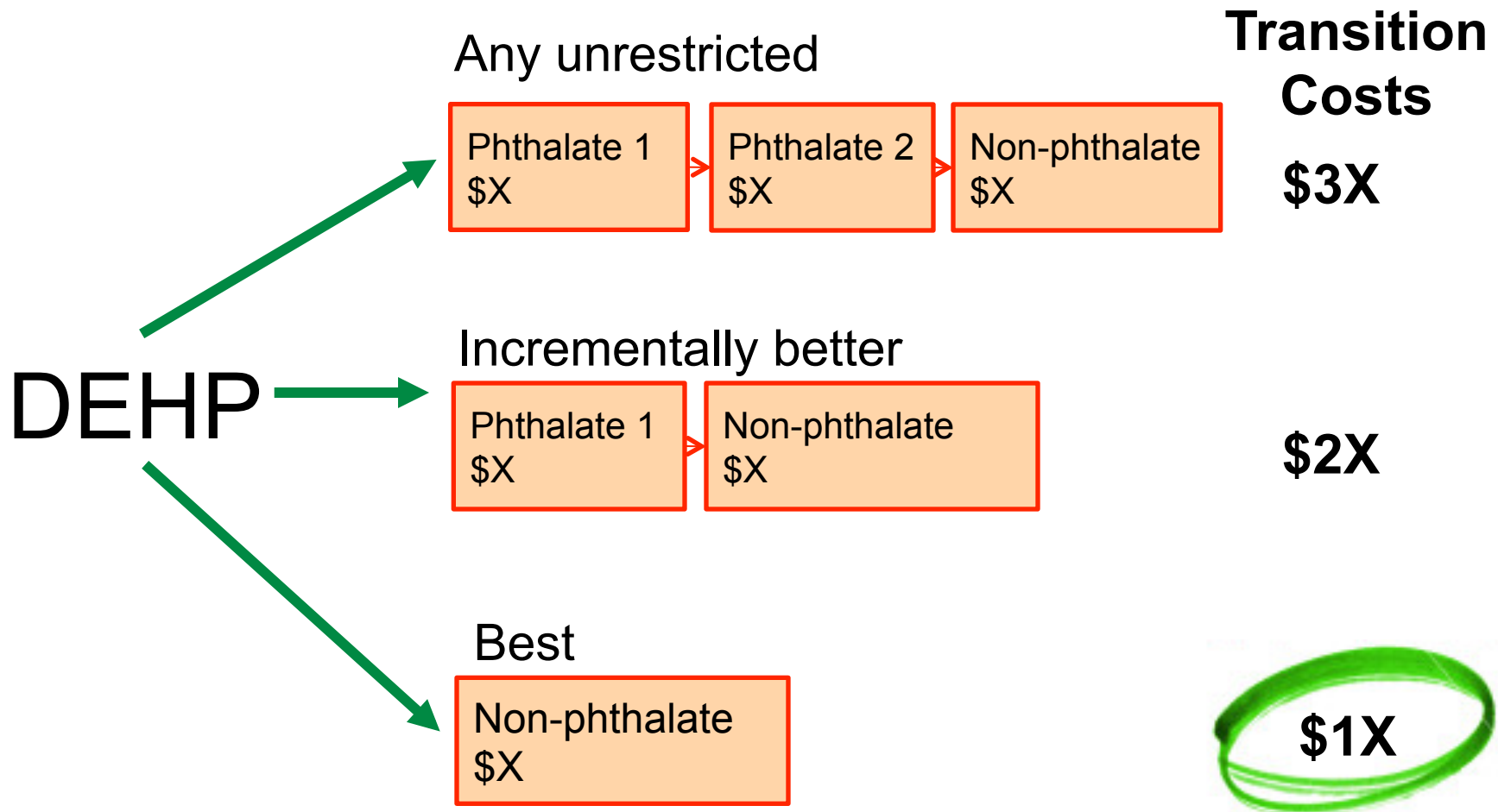
Avoiding extra substitutions saves money



Avoiding extra substitutions saves money

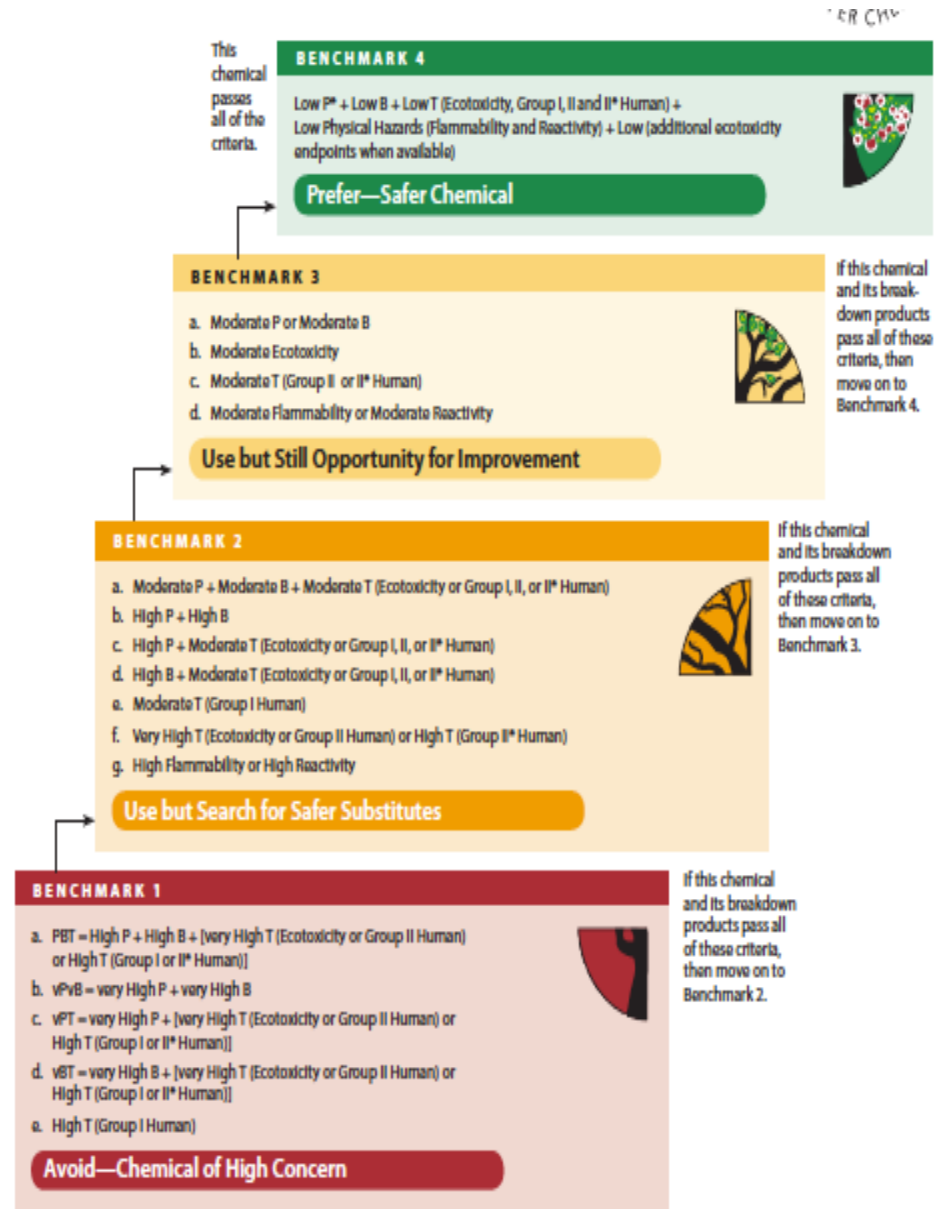


Avoiding extra substitutions saves money



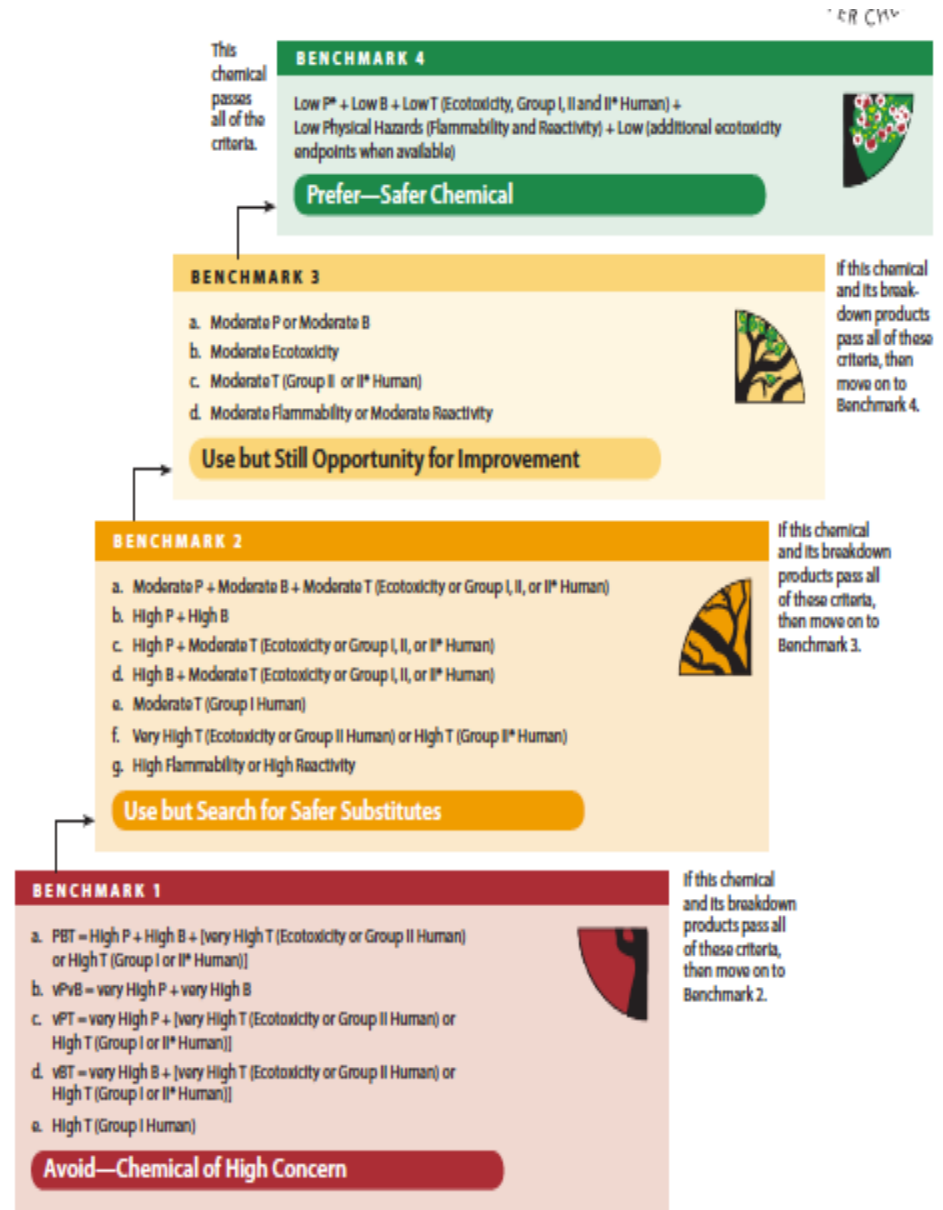
GreenScreen™

- Substances starts at bottom and can only pass to next level if no criteria apply



GreenScreen™

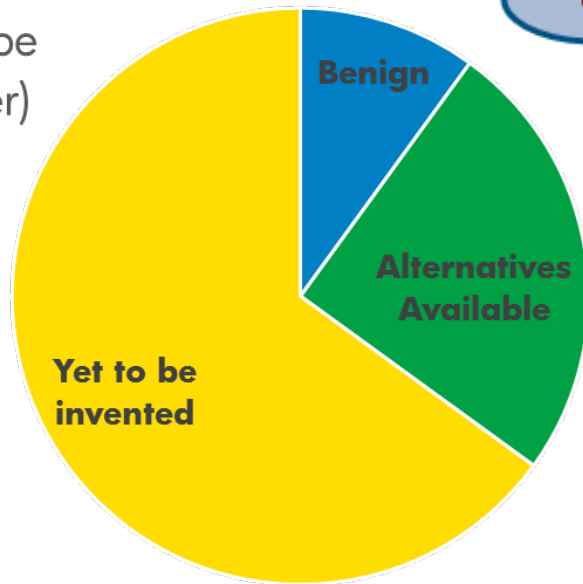
- Substances starts at bottom and can only pass to next level if no criteria apply
- Requires technical expertise to apply the benchmarks but anyone can understand the simple 1-4 benchmark score



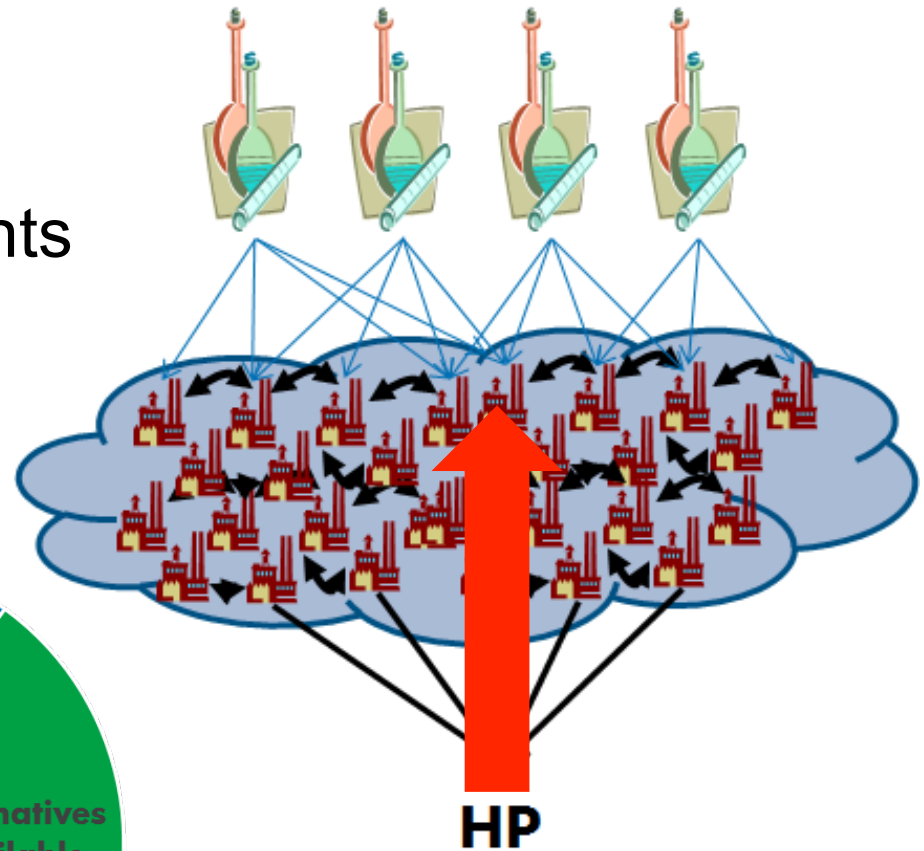
What has changed?

If we articulate environmental requirements to our suppliers, we get better materials

Chemical Landscape
(from John Warner)



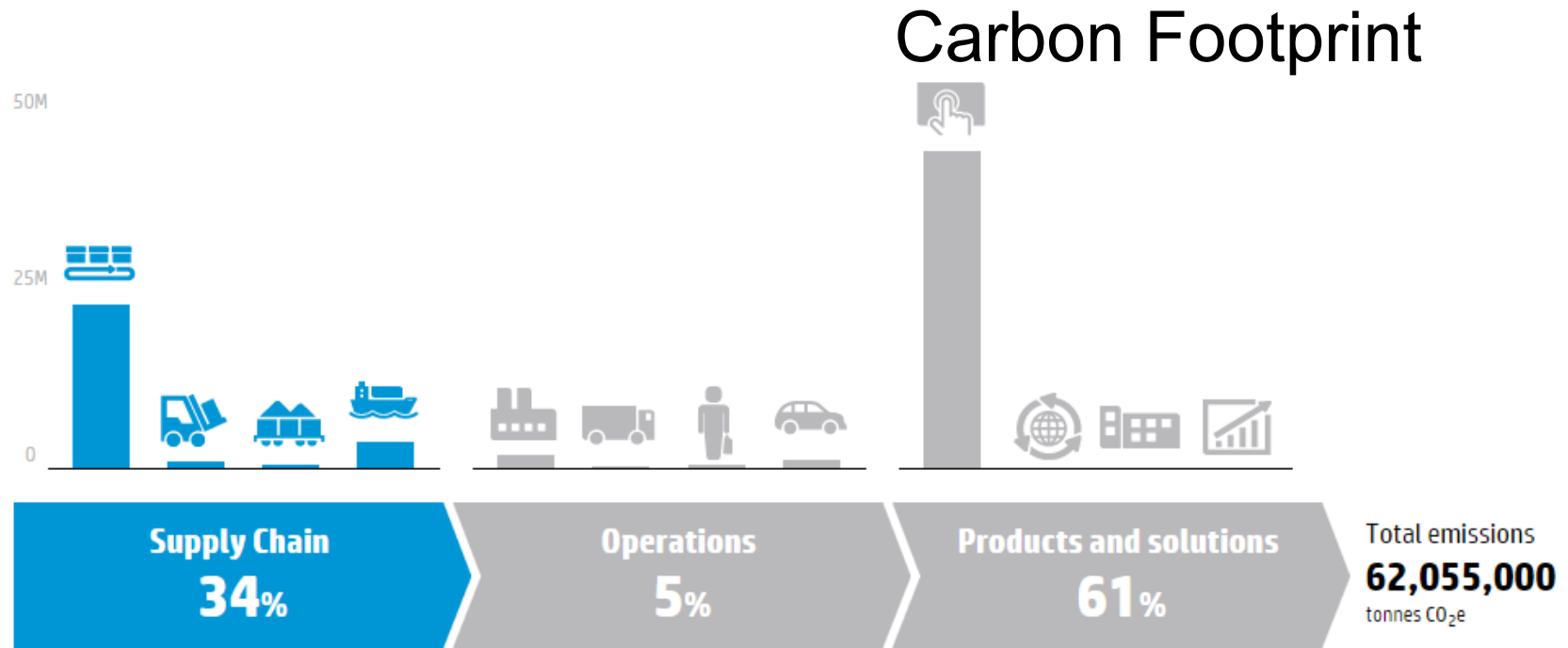
Formulators



What else is HP doing in the environmental space?

Carbon

Water



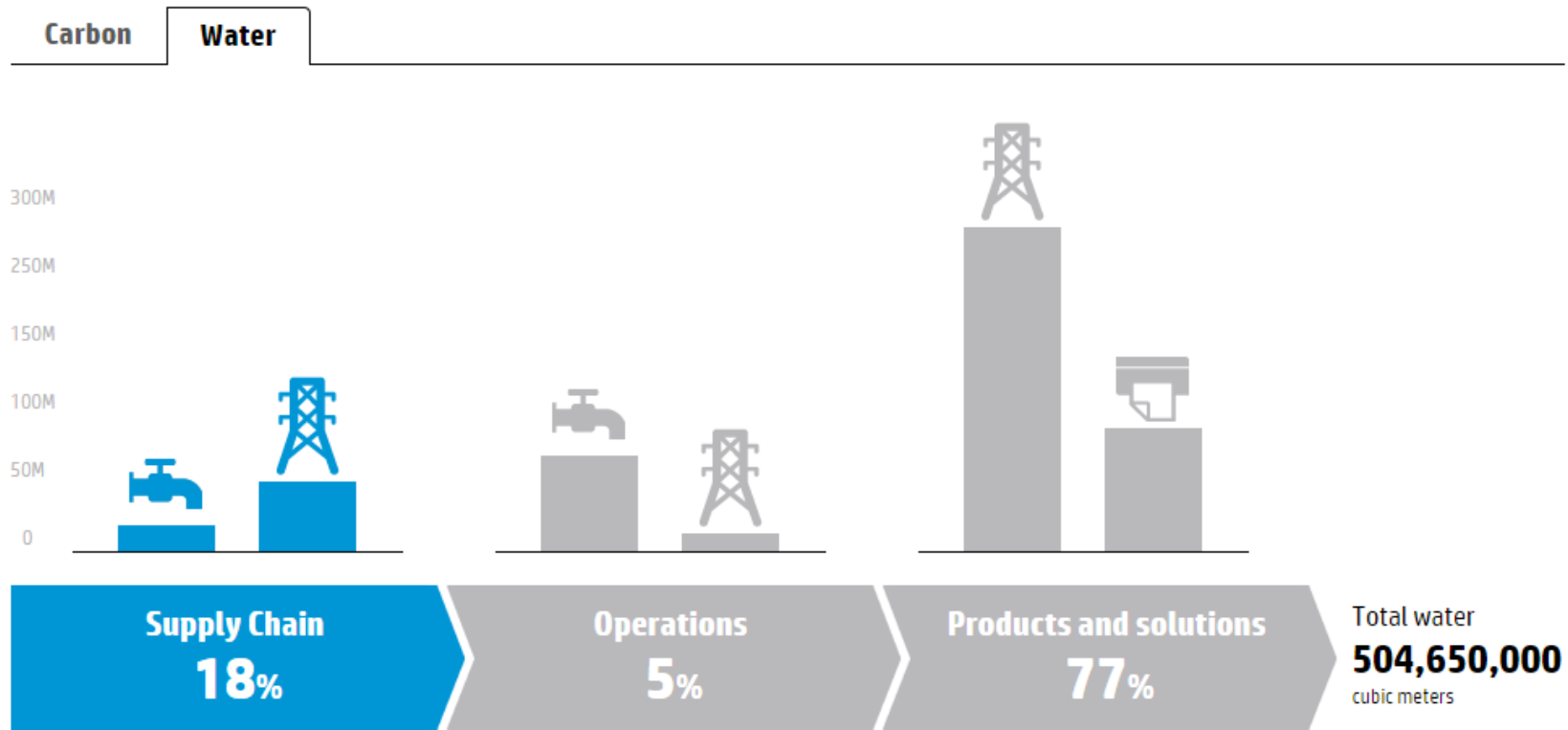
Greenhouse gas emissions in our supply chain result mainly from the raw materials used in, and manufacture of, our products.

[View complete data and goals](#)

*To calculate Scope 1, Scope 2, and Scope 3 emissions, HP has followed the principles outlined in the Greenhouse Gas Protocol. HP calculates intensity as its suppliers' GHG emissions divided by HP's annual revenue. This method normalizes performance based on business productivity. Ernst & Young has reviewed HP's global Scope 1, 2, and 3 GHG emissions for the years included.



Water Footprint




Our suppliers affect our water footprint primarily through their use of electricity. We encourage suppliers to use and discharge water responsibly, and provide tools that improve water management practices.

[View complete data and goals](#)



About supply chain responsibility


+ Share  Like 49 people like this. Be the first of your friends.

1st

IT company to introduce guidance for the treatment of student and dispatch workers



Conflict minerals

+ Share  Like Be the first of your friends to like this.

1st

IT company to publish the smelters used by suppliers



The mining of minerals used to produce tantalum, tin, tungsten and gold has been linked to the funding of armed groups fueling violent conflict in the Democratic Republic of Congo (DRC). Together known as 3TG, these valuable metals are used in many industries and consumer products, including electronics.

Any possible connection between our products and the funding of armed conflict is unacceptable to us. We are working hard to ensure that the 3TG used in our **supply chain** is not associated with the conflict in the DRC.

About supply chain responsibility

Conflict minerals

+ Supplier SER requirements

Audit Findings

Capability building

CA Transparency in Supply Chains Act of 2010

Product Stewardship

- Ensure that products meet environmental requirements
- Good entry point for environmental jobs
- Report into the businesses (desktops, laserjet etc.)



Regional Teams—Public Affairs

- Monitor and influence environmental regulations in the regions (Americas, EMEA, APJ)
- Waste/supplies program manager
- WEEE program manager
- Chemical/materials program manager
- Green public procurement
- Energy program manager
- Customer engagement



Legal—Corporate

- Materials strategy and compliance
- Outline the path to compliance with future regulations

- Compliance program manager
- Conflict minerals program manager
- Reuse and recycling program manager
- Materials strategy program manager



Other

- Environmental Marketing
- Corporate sustainability
- Product designers
- Mechanical engineers
- Chemists
- Materials Scientists





Thank You !

Oh the places you'll go with Green Chemistry!

Kristi Budzinski, PhD
Genentech, Inc.

Education Overview



Undergraduate:

BS-Biochemistry/Math

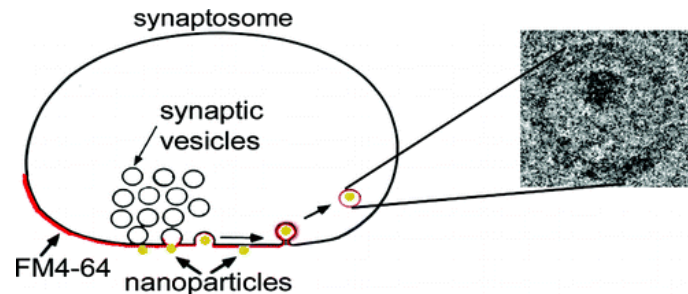
Research experience: inorganic lab & biochemistry lab



Graduate:

PhD-Chemistry

Research experience: Spectroscopy



Green Chemistry Revelation



ACS Summer School
on Green Chemistry &
Sustainable Energy



From Academia to Industry



Genentech
A Member of the Roche Group



photo: iStockphoto

Green Genes



AWIS
ASSOCIATION FOR WOMEN IN SCIENCE
San Francisco

Founder of biotechnology industry

Mission: Our goal is to use the power of genetic engineering and advanced technologies to make medicines that address unmet medical needs, and help millions of people worldwide. Our commitment to sustainable development respects the needs of the individual, the society, and the environment.

South San Francisco Headquarters

- 13,000 employees support entire value chain
- Additional manufacturing sites in Vacaville and Oceanside, CA

Member of Roche Group since 2009

- Robust GNE/Roche clinical development pipeline
 - 37 marketed products
 - 45 NMEs in clinical trials
- Increased emphasis on corporate environmental sustainability





SSF Site goals by 2014



↓ 15%



↓ 10%



↓ 50%

CALIFORNIA'S
BEST
BUILDINGS
CHALLENGE

20 % energy, water,
and waste reductions
in just 2 years





Green Genes

Grass roots: ~3000 members and growing, formed 2002.

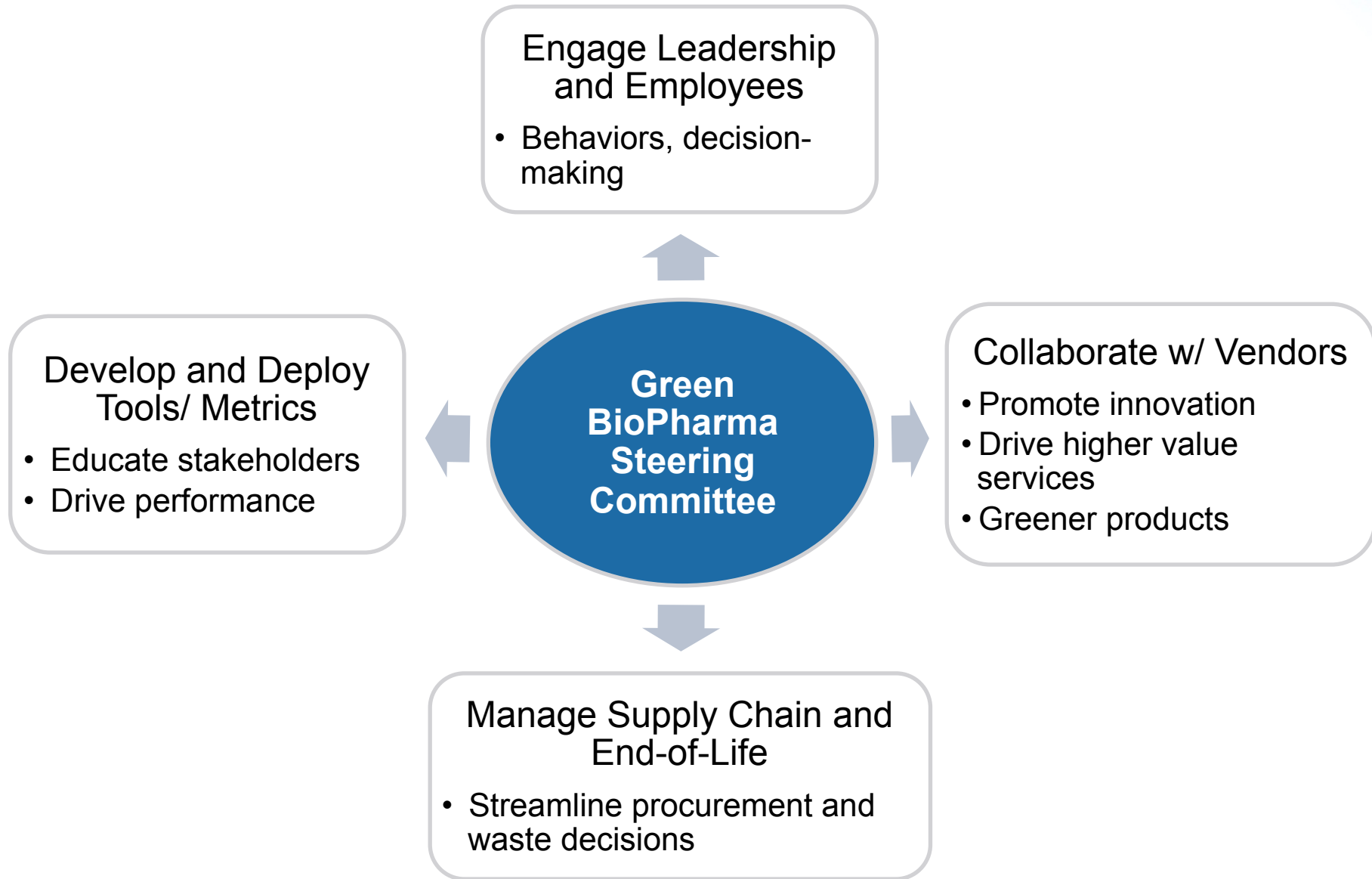
Mission Statement:

- To increase our colleagues' knowledge and awareness of sustainability
- To provide a forum to generate, exchange, and evaluate sustainability ideas to improve the environmental performance of Genentech's operations, our communities, and our homes
- And to have fun while leading by example in our industry.

More green genes members means more environmentally-conscious scientists!



Green BioPharma Program Manager



Creating a Green BioPharma Culture



bit.ly/1b24aRO

lessons from the afterlife

Drummond Lawson

Director, Materials Research and Sustainability

Arc'teryx Equipment Inc.

background

- Undergrad in environmental science / chemistry, grad school in environmental chemistry
- First 'legit' job in environmental technology labwork.
- Post-masters internship in materials assessment, applied to product design
- 8 years experience in roles focused on product development, materials research, and sustainability.

so what exactly is a greenskeeper?

Method's greenskeeping department's simple mandate: dream up and build the best ideas to make the company, products, and partners operate more sustainably.

- ingredient assessment and packaging assessment as design inputs
- supply chain guidance: transparency, process and operational efficiency
- make the technical basis relevant to the full business: brand communications and sales / retailer engagement



Archaeopteryx lithographica

- Arc'teryx: outdoor gear and apparel
- Founded 1989 in Vancouver BC
- Product of obsessive climbers, mountaineers and skiers
- Fast growth built on high performance technical apparel



ARC'TERYX

advanced materials research =



- materials research: build materials chemistry inputs to product development process
- engage upstream suppliers to build differentiated pipeline: link product advantages to product chemistry
- develop proactive materials management approach: anticipate regulatory / supplier changes, influence possible drivers, inform our decisions

reflections

- what technical skill do you want to own?
- be a polyglot. (in a brand, relevance is critical)
- read the fine print. (regulatory / legal / policy world is as important as it is boring)
- hang out with the people in cool glasses. (designers are key partners)

Thanks for joining us!

For more information about the GC3:
www.greenchemistryandcommerce.org

For more information about NESSE:
www.sustainablechemists.org

