



**A new approach to the phase-out
of hazardous substances,
GreenScreen[®] for Safer Chemicals**

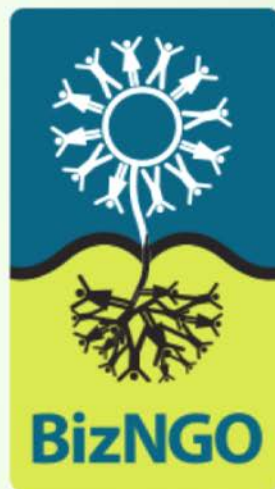
Mark S. Rossi, PhD

Clean Production Action

11 November 2015



Clean Production Action



Together, we're creating a safer
and healthier future

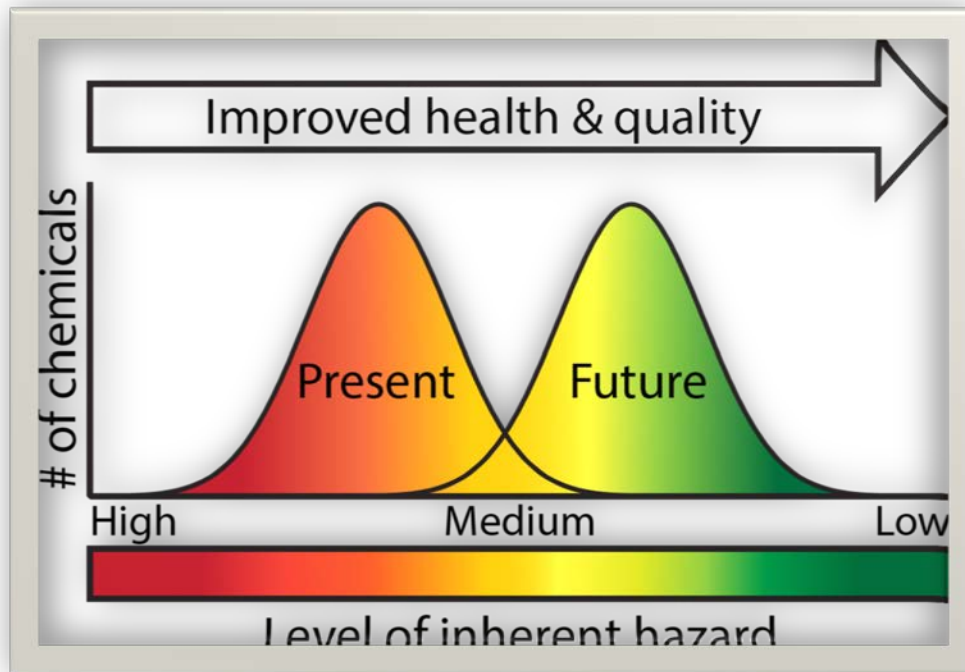
and healthier future

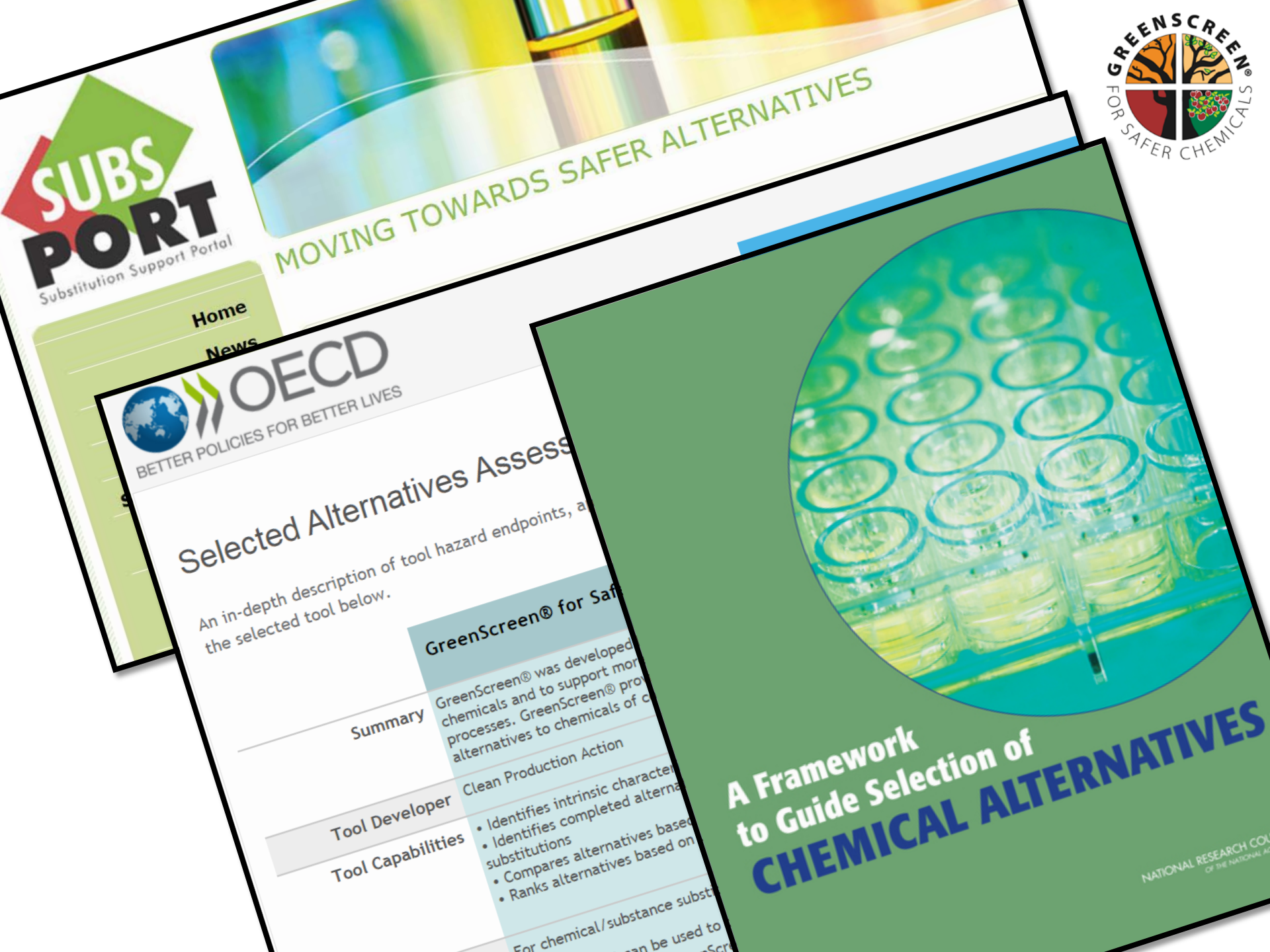
What is GreenScreen?

A chemical hazard assessment method
(hazard x exposure = risk)



- Transparent
method is freely and publicly available
- Scientifically robust
- Systematic
- Comprehensive





**SUBS
PORT**
Substitution Support Portal

MOVING TOWARDS SAFER ALTERNATIVES

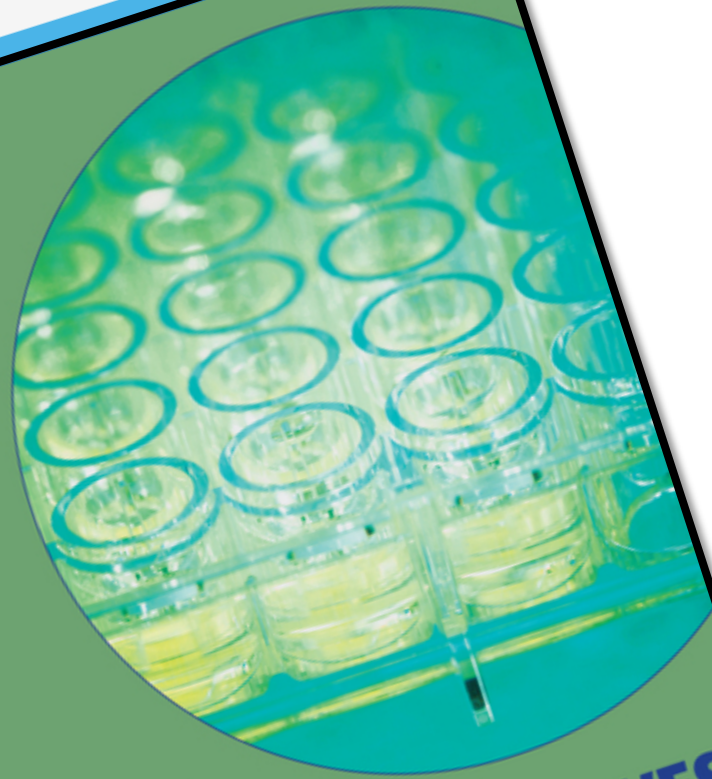
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Selected Alternatives Assessment

An in-depth description of tool hazard endpoints, and the selected tool below.

Summary	GreenScreen® for Safer Chemicals was developed to support more processes. GreenScreen® provides alternatives to chemicals of concern.
Tool Developer	Clean Production Action
Tool Capabilities	<ul style="list-style-type: none">• Identifies intrinsic characteristics• Identifies completed alternatives• Compares alternatives based on hazard• Ranks alternatives based on hazard
For chemical/substance substitution	can be used to

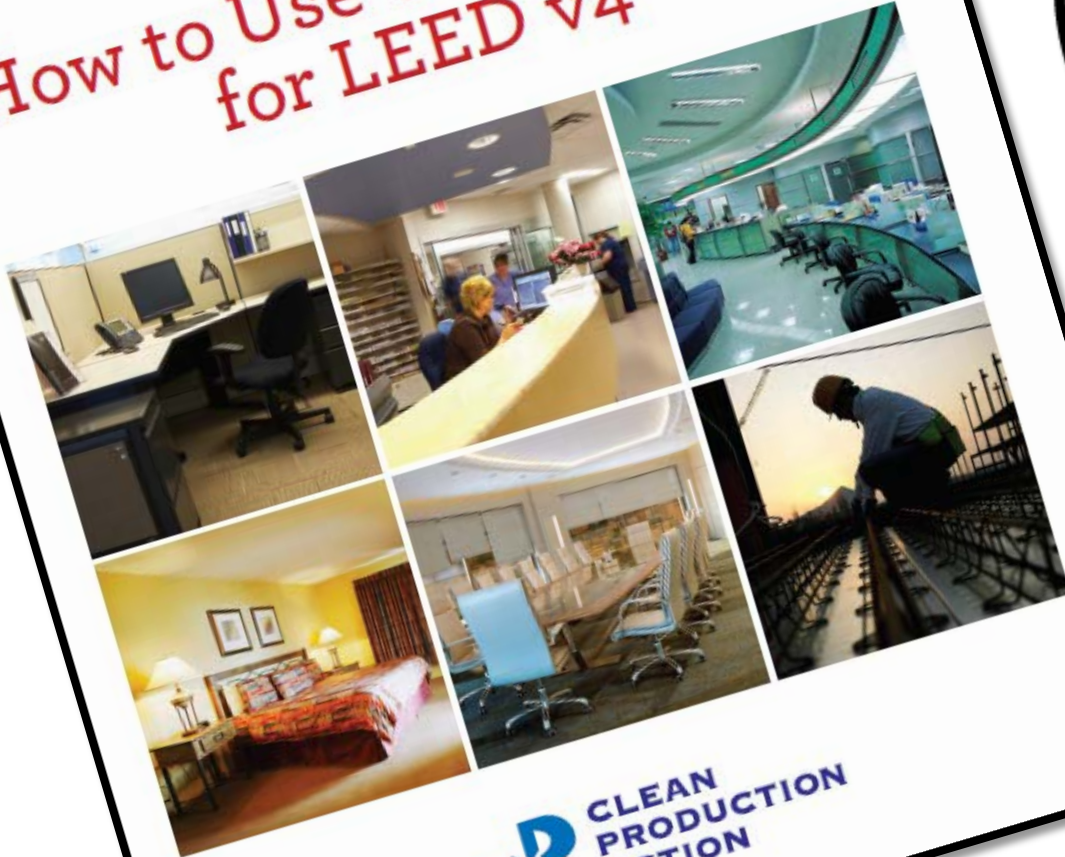


**A Framework
to Guide Selection of
CHEMICAL ALTERNATIVES**

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES



How to Use GreenScreen® for LEED v4



Green Screen for Assessing Replacements for Restricted Substances in Electronics

- Key screening tool that HP uses for alternatives assessment when replacing a restricted substance
- Enables identification of better materials, not just minimum acceptable
- Green Screen results are only part of decision, but initial hazard screening deselects certain options early in assessment process
- HP continues to use Risk Assessment, LCA, and Carbon Footprint tools to complement





18 Hazard Endpoints

Chemical Hazard	
Persistence	Neurotoxicity
Bioaccumulation	Acute Toxicity
Acute Aquatic	Corrosion/Irritation of the
Chronic Aquatic	Skin or Eye
Carcinogenicity	Sensitization of the Skin or Respiratory System
Mutagenicity / Genotoxicity	Immune System Effects
Reproductive toxicity	Systemic Toxicity/Organ Effects
Developmental toxicity	Explosive
Endocrine Disruption	Flammability



GREENSCREEN

For Safer Chemicals



BENCHMARK 1

Avoid — chemical of high concern

BENCHMARK 2

Use, but search for safer substitution

BENCHMARK 3

Use, but there's still opportunity for improvement

BENCHMARK 4

Prefer — safer chemical

Drives the selection of inherently safer chemicals



Green Screen Assessments of Similar Function Chemicals		
Common Name	CAS #	Function
Preferred		
Design		Serialize
Substance 0		
Use but still opportunity		
Substance 1		Chemical name
Substance 2		Chemical name
Use but still opportunity		
Substance 3	#####-##-#	Chemical name
Substance 4	#####-##-#	Chemical name
Substance 5	#####-##-#	Chemical name
Substance 6	#####-##-#	Chemical name
DO NOT USE		
Substance 7	#####-##-#	Chemical name
Substance 8	#####-##-#	Chemical name
Substance 9	#####-##-#	Chemical name
Substance 10	#####-##-#	Chemical name
Substance 11	#####-##-#	Chemical name
Substance 12	#####-##-#	Chemical name

TIC DEVELOPMENT



Thank You!

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