



## SUBTHEME 3: Summarize Data and Results for Dissemination

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**Maiko Ebisudani, Ph.D. 2<sup>nd</sup> year**

Department of Sustainable Energy and Environmental Engineering  
Graduate School of Engineering, Osaka University, Environmental Management

2016/09/02

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## OUTLINE

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- I . Research Plan Overview
- II . Subtheme 3 Objective
- III . Progress and Outcome
- IV . Future Plan

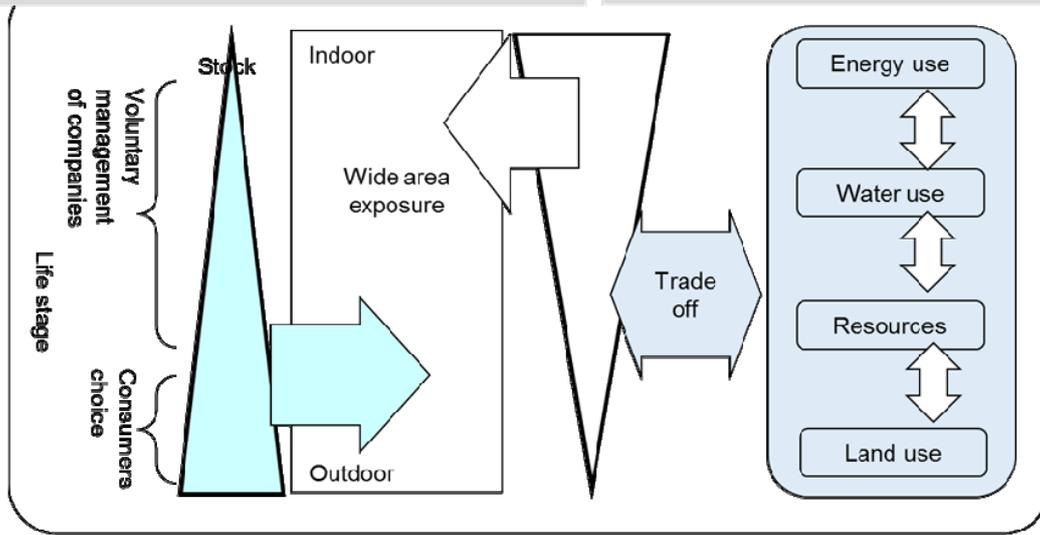
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SUBTHEME 3: Summarize Data and Results for Dissemination



**ST1:** Categorization of chemicals and products, stock estimation under the future scenarios analysis

**ST2:** Development and application of risk tradeoff analysis



**ST3:** Summarize Data and Results for Dissemination

To increase the reliability of our risk evaluations.

- Review acceptable risk ranges and statistical values (e.g. average, median, etc.)
- Results will be checked against previous research and case studies.



Implementing risk assessment and scenario analysis, which already consider uncertainty, will improve the decision-making process.

## ◆ Review risk assessment report template

### Book

Benjamin, S. L., & Belluck, D. A. (Eds.). (2001) *A Practical Guide to Understanding, Managing, and Reviewing Environmental Risk Assessment Reports*. Florida, FL: CRC Press LLC.

### Report

U.S. EPA (2001). Risk Assessment Guidance for Superfund: Volume I Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)

**Aim:** Find a candidate template able to incorporate both risk evaluation and risk tradeoff analysis.

## ◆ Findings from review research: Common items in a template

Table 1: Selection of exposure pathways (U.S. EPA, 2001)

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
past	groundwater	groundwater	tap water	resident	child	dermal	model name	selection reason
present	groundwater	air	water vapors from showerhead	resident	adult	inhalation	equation	deletion reason
future	soil	soil	soil at site 1	resident	child	ingestion		

Table 2: Calculation of chemical cancer risks and non-cancer hazards (U.S. EPA, 2001)

Medium	Exposure Medium	Exposure Point	Chemical of potential concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
groundwater	groundwater	Aquifer1-tap water	Chloroform Heptachlor	5E-07 1E-03		1E-06 6E-04	2E-06 2E-03	Liver Liver	0.03 2		0.05 0.8	0.08 2.8

- ◆ Additional new items for Table 1: Selection of exposure pathway  
 Lifetime stage = production, use, disposal  
 Case study = refrigerant, detergent, adhesive  
 Scenario = actual case, counterfactual case

Lifetime Stage	Case Study	Scenario Timeframe	Scenario	Medium	Exposure Point	Exposure Route	Type of Analysis	Rationable for Selection or Exclusion of Exposure Pathway
PRODUCTION	Refrigerant (#10)	1952-2030	Scenario A: actual case.	Air conditioner	P-AC11+ Chemical substance	Inhalation	MOE/HQ	Refrigerant is gas. 100% refrigerant goes to the atmosphere. It is not bio accumulate, so exposure by ingestion is not possible.
		1952-2030	Scenario B: counterfactual case	Air conditioner	P-AC12+ Chemical substance	Inhalation	MOE/HQ	
		1952-2030	Scenario C: counterfactual case	Air conditioner	P-AC13+ Chemical substance	Inhalation	MOE/HQ	
	Detergent (#30)							
	Adhesive (#50)							
USE	Refrigerant (#100)	1952-2030	Scenario A: actual case.	Air conditioner	U-AC101+ Chemical substance	Inhalation	MOE/HQ	Refrigerant is gas. 100% refrigerant goes to the atmosphere. It is not bio

- ◆ Additional new items for Table 2: Summary of calculation results  
 Lifecycle assessment = energy consumption, water consumption

Lifetime Stage	Case Study	Medium	Exposure point	Chemical of Potential Concern	Life Cycle Assessment		Cancer Risk				Non-Cancer Risk					
					Energy Consumption	Water Consumption	Ingestion	Inhalation	Dermal	Exposure Routes Total	Ingestion	Inhalation	Dermal	Exposure Routes Total		
PRODUCTION			P-AC11	R-22			NR	NR	NR	NR	NR	NR	in process	NR	in process	
			R-410a			NR	NR	NR	NR	NR	NR	NR	in process	NR	in process	
			R-32			NR	NR	NR	NR	NR	NR	NR	NR	in process	NR	in process
			P-AC12	R-22			NR	NR	NR	NR	NR	NR	NR	in process	NR	in process
			R-410a			NR	NR	NR	NR	NR	NR	NR	NR	in process	NR	in process
			R-32				NR	NR	NR	NR	NR	in process	NR	in process		
			Air conditioner Total													
			Refrigerant Total													
			Laundry Total													
			Detergent Total													
			Wooden furniture Total													
			Glass/Adhesive Total													
USE			U-AC101	R-22			NR	NR	NR	NR	NR	NR	MOE=3.47E+09	NR	MOE=3.47E+09	
			R-410a			NR	NR	NR	NR	NR	NR	NR	MOE=1.64E+07	NR	MOE=1.64E+07	
			R-32			NR	NR	NR	NR	NR	NR	NR	NR	NR	MOE=1.24E+07	
			U-AC102	R-22			NR	NR	NR	NR	NR	NR	NR	NR	NR	MOE=1.24E+07
			R-410a			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
			R-32				NR	NR	NR	NR	NR	NR	NR	NR		
			Air conditioner Total	U-AC101											MOE=7.03E+06	
			Refrigerant Total													
			Laundry Total													
			Detergent Total													

Lifetime Stage	Case Study	Medium	Exposure point	Chemical of Potential Concern	Life Cycle Assessment		Cancer Risk				Non-Cancer Risk					
					Energy Consumption	Water Consumption	Ingestion	Inhalation	Dermal	Exposure Routes Total	Ingestion	Inhalation	Dermal	Exposure Routes Total		
PRODUCTION	A	Air conditioner	P-AC11	R-22	★	★	NR	NR	NR	NR	NR	in process	NR	in process		
			R-410a	NR			NR	NR	NR	NR	in process	NR	in process			
			R-32	NR			NR	NR	NR	NR	in process	NR	in process			
			P-AC12	R-22			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
			R-410a	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	
			R-32	NR			NR	NR	NR	NR	NR	NR	NR	NR	NR	
Air conditioner Total														★		
Refrigerant Total																
Laundry Total																
Detergent Total																
Wooden furniture Total																
Adhesive Total																
USE			U-AC101	R-22			NR	NR	NR	NR	NR	MOE=3.41E+09	NR	MOE=3.41E+09		
			R-410a	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			
			R-32	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			
			U-AC102	R-22			NR	NR	NR	NR	NR	NR	NR	NR		
			R-410a	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
			R-32	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
Air conditioner Total															MOE=7.03E+06	
Refrigerant Total																
Laundry Total																
Detergent Total																
Wooden furniture Total																
Adhesive Total																
DISPOSAL			W-AC1001	R-22			NR	NR	NR	NR	NR	in process	NR	in process		
			R-410a	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			
			R-32	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR			
			W-AC1002	R-22			NR	NR	NR	NR	NR	NR	NR	NR		
			R-410a	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
			R-32	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
Air conditioner Total																
Refrigerant Total																
Laundry Total																
Detergent Total																
Wooden furniture Total																
Adhesive Total																

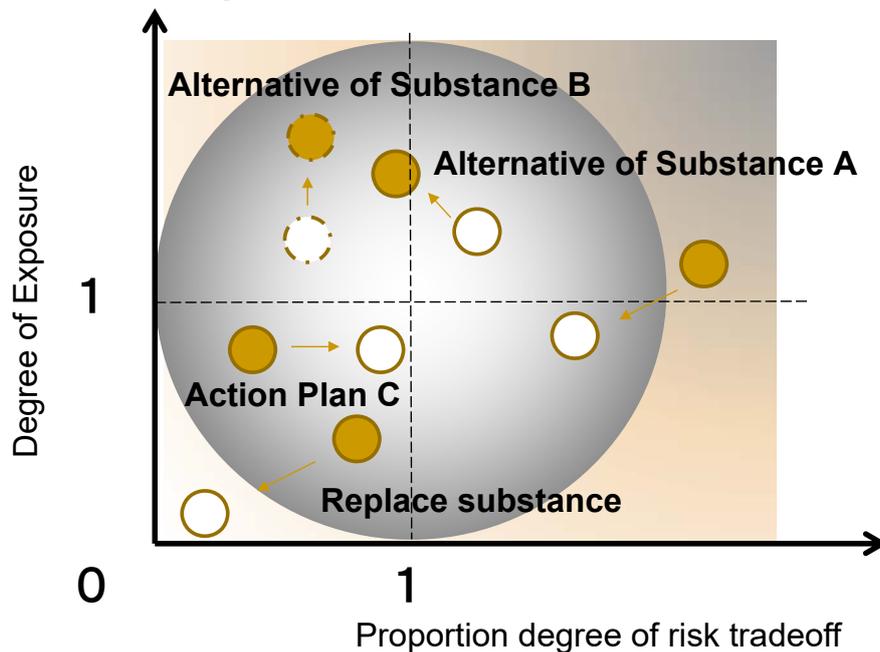
◆ Advantages of the report

1. Identify high risk scenarios and high risk pathways ⇒ to help strategy planning
2. Evaluate the variety of endpoints ⇒ to understand tradeoff
3. Prioritize action plans within product types or scenarios.



### III. Progress and Outcome

◆ Conceptual Diagram



## Fiscal year 2016

Disseminate and gather knowledge through workshops, study sessions and website. Input remaining data to complete the report.

- November 25<sup>th</sup> and 26<sup>th</sup> The Society of Risk Analysis Japan in Oita Prefecture

## Fiscal year 2017

Apply data to environmental policy and strategy for overall development. Hold regular lecture meetings, once every two months (End of April, June, August and October).

- ◆ Website available in Japanese and English translation will be provided in the near future.



[http://www.see.eng.osaka-u.ac.jp/seeem/seeem/03\\_theme\\_risk\\_governance\\_pj/index.html](http://www.see.eng.osaka-u.ac.jp/seeem/seeem/03_theme_risk_governance_pj/index.html)

**Thank You for Listening!!**

**Q and A**