Tim: Interested in how businesses make decisions in a reg process:
- two kinds of decisions: screening & comparing alternatives
- Decisions are being made all the time: Product design formulation, Retail sales etc.
- What are the ways you make decisions? Which decision factors are most important?
- What mechanisms are used for making decisions?
- What kind of process? How is it done now?

Global organization – lots of formulators throughout world
- company has corporate constraints & internal regs
- decision parameters are based on use:
  - Safety aspects: globally applied & established by company
  - Supply chain: ingredient availability
  - Biodiversity
  - Environmental safety
  - Government regs: similar for prods that are mods of existing prods
  - Legal requirements: ie, patents
  - Consumer requirements & testing – customers can be retailers & each has own requirements;
    potentially a huge number of variables: Wal-Mart, Target, K-Mart
- Packaging plastics, different globally: PP big in EU; HDPE in US for recycling; Different interests
- recycling is nonexistent in some parts of the world
- Global teams responsible for product – get info from other sources wrt local considerations

What is the process?
- Linear and iterative process: back and forth
  - ie: CARB reg re: products: tech proj leader + proj leader + teams = lots of spokes on hub

- Labeling is important
- Consider Environmental and human health together
- Needs to be Safe in a river and in a sewer facility in California

Automotive industry:
Various organizations for global and national standards: SAE, ISO, EU, global, US, state

Development – 10-year process
Two products comparison Co2 refrigerants;
  Efficiency
  Greenhouse gas
  Passenger safety
  Phase-out 141 A-EU
But, manufacturer stopped process
Testing uncomfortable

Who made decision?
- Narrative method
- Specific parameters looked at
- Certain minimums have to met

US EPA approval – SNAP Program
Refrigerants:
Alternative to 134
Narrative decision approach and qualitative risk assessment

Do others use this?
Qualitative process & narrative
With Utilities, safety is a key driver:
Safety drivers
Risk drivers
Liability for decisions

Rate challenge every two years
Cost becomes a driver – risk is considered from a financial standpoint

Tire industry – safety is driver: NTSA Federal safety standards are threshold factor
- change in a tire can’t be considered if it does not comply
- later, consider if tires help cars meet emission stds

What is beyond?
- Marketing issues
- Car companies’ requirement

New innovation? Innovation perspective:
- Intellectual property impact
- ingred safety – first consider reg issues, safety & feasibility, then consider business-oriented decision aspects
- alts for existing prods must also consider mkt claims, a part of functionality:
  Does it support claims?
  Does it have regulatory problems? Group will discuss
  Is it feasible? Efficacy, consumer acceptance
  What is the market? Mkt position, competition
  Is it worth it?
  Cost? Cost of ingreds, alts, parameters of distribution

How do they consider all these factors?
Hierarchy decision – executive decision informed by scientific/tech info
- mid-level decisions determine: ID options, screen, move on
Different disciplines gather together to make a decision:

Clorox – Global Stewardship – hub of decisionmaking
- Every product reviewed
- Tools are: Laws
  Regs
  Safety/toxic - Safety tool: 3E global tool with data
- Safety & environmental requirements for company, sustainability, toxicology, regs, international requirements – experts in all these areas
- Ok by all groups
- Does it meet minimums? If product does not meet threshold, suggest alts: ID Two or Three that met min. levels:
- Business decision does the product do what (it) is trying to do? Compare alts, primarily according to efficacy & cost.
- Data: rely on suppliers for this
- Contaminants: rely on suppliers to avoid or be aware of these
- Using Internal tools – evaluate product
  - 30 attributes at first, then as a whole

Heard two things
- Multiple attributes – compensatory Balancing of them; using Narratives
- Series of Thresholds, then move to different considerations, ie: marketing functions

Final decision point: consumer research indicates a need
- did mkt project a target?
For decisions: analyze, assess, test, etc

Worried about contaminants in raw materials
Life cycle
Two/three attributes To focus on for a decision
Testing & evaluations

Challenges to making a decision?
What to do when there is no clear alternatives or nothing is better.
Tradeoffs among criteria; pressure from reg & efficiency needs
How do you gauge relative importance of attributes when there is no clear indication?

Car design - Mandate on us; reduce fuel use alternative materials
   Lighter?
   Recyclable?
   Feasible?
Reevaluation 2020

Cost vs. function? How do you make this judgment?

Scoring matrix w/weights & criteria
   - Clorox designed an internal tool, with weightings; considers envl, health, sust policy of supplier & other factors

House of Quality - six sigma, q-matrix
   - score for importance
   - score for quality

Sustainability – looked at points for each attribute?
YES
Fold them all together
Importance & cost score

Can guidance help with how to specify weights?
   - benchmarking - Competitor bench mark
   - how to do weighting is important in guidance, not what weights should be
   -JD Power weighing scoring – give info on wts in automotive sector

Optimization modeling process?
   - develop algorithms for sustainability
   - Sustainability analysis – use such a model

Guide to DTSC?
   - Guidance should address Supplier participation: what's expected at each stage in supply chain
   - How to weigh each role in the supply chain?
   - Room for businesses in the middle between supply & manufacturer
   - Industry-specific guidance
   - Checklist of things DTSC wants to see/ want you to consider
     - comprehensive list of factors – thought exercise
   - Grading scale/how will we pass?
     - clear stds about decision criteria & how it will be weighted
   - sufficient time to make changes – some changes will take years rather than months
   - recognition that other laws also form basis for decisions
   - Harmonize with other jurisdictions /regs & laws: Europe, Asia, etc. typically one global product
Decision Methodology PM

How is decision making done?
Two schemes in regs screening decision-making:
Identify one or more safer alternatives;
Peculiar methods for product decision-making?
Long time consideration of all these kinds of attributes
Weighing will change functionality cost > important
Branding is important sustainability is part of that.

Room – all parts of company represented
Consensus process
Veto by sales – traditional
   - Will change.
What has kept “Barbie on Market?”
Existing process close to the safer products regs
Existing process based on only looking at existing regulatory thresholds
DTSC wants both to hopefully, tell us about their decision making process
Look at all the data; decide on alternatives; make final decision
Outside factors will force the decision
Guidance: What would be most helpful in Guidance?

Weighting might be difficult – been doing LCA/aa-type decisions for long time
   - efficacy is important
   - manufacturing feasibility
   - economic feasibility, esp for publicly traded companies
   - regs
   - branding considerations.
All involved in decision are in room: HSE, tech, mgmt., sust
Then they use a consensus process w/vetoes by sales/marketing

Example:
Item; issue; frame problem; other sust factors; sales info; propose several solutions; elim undesirables; then arrive at final decision: create new or buy or allow to decline, etc

Decisions are affected by other factors: other ban/restrictions

Different processes used at different points:
   (1) Scorecard for ranking products
   (2) Then those that rank lower go to second, more consensus-based process to decide what to do at this point

Safety is bottom line for products – consumer and occupational exposure
   1st screen - Multiple attributes, vary depending on product & used in future iterations of product – safety, performance, cost – balancing is done using proprietary internal decision-making tool.
      - What is important about this product
      - History of product
      - We do not use it if it does not enhance the product.
      - Sourcing of raw materials...
All a part of initial screening - Clorox has a formal decision tool for initial screening

No negotiation on safety – other attributes subjected to a rigorous evaluation process
After screening – formalized process for other attributes: ID sourcing, raw material, acceptability, availability, finite vs renewable source, new technology (ie: nano), regulatory hurdles, infrastructure feasibility, retooling/retraining, air & water quality standards, manufacture/use/EOL, efficacy (product claims), costs, consumer acceptance & customer acceptance

Guidance
Clorox – Part of decision making
- Efficiency
- Cost
- Regulatory screen

Alternatives analysis on REACH?

Manufacturer

<table>
<thead>
<tr>
<th>Two different criteria</th>
<th>Make for a retailer/customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market for an end user</td>
<td></td>
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Three different products based on customer:
- Hispanic 1 one highly fragrance cleaning product
- Non-Hispanic one less fragrance
- Allergy sensitive customer one no fragrance

How to weigh the attributes of product?
R&D senior leadership team w/experts - Team has all major elements of company represented
- legal, regulatory affairs, govt affairs, science team, supply/procurement
- weighting is product-specific & made in R&D at higher org level
- need a balance that addresses any product concerns (ie: cultural sensibilities)
- Driven by product & its attributes
- corporate culture & tolerances for risk affect decision (conservative & risk-averse behave differently from risk takers; also publicly owned vs privately held)
- Basic manufacturer different then formulator
- Different approaches affects decision making

In guidance, want certainty & clarity – what is acceptable & required for compliance
- meet goals of statute & requirements of regulation
- minimize interaction, but all interaction to occur
- provide opportunity to mitigate – not always back to start
- Manufacturer will want to know that it will pass muster
- Clarity in guidance
- What/how to comply

Self-certification opportunity?
- acceptance/designation by manufacturer

Take stakeholders into account – depending on products & corporate culture
- Info from outside sources-important for decision making
- Clorox involved Sierra Club in their Green Works line development