Expected Contributions to the Taskforce for CE Cost Estimation

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Goal of the task force

- Produce a detector layout as input for local teams
  - Review & update triangle layout
  - Review & update 2L layout
- Compatible with
  - reasonable cost of civil infrastructure
  - science goals
    - reasonable technical risk
    - reasonable flexibility
- Identify requests to civil infrastructure preliminary design in view of further design steps
- Time frame: 3÷4 months
- Output to be reviewed by external committee TBD

Coarse rationale

- Identify major offenders on infrastructure costing
- Identify options on detector layout to prevent infrastructure cost to explode
- Search for possible options that might improve cost without sacrifice of performance
  - if needed, consider technical solutions with lower technology readiness than baseline
- Not an optimization
  - infrastructure cost cannot be precisely predicted without civil engineer design study
  - uncertainty in preliminary costing sets the target to options
  - discard options to bring minor cost reduction with technical risk
- Output document for each of the 2 geometries
  - detector layout including flexibility envelope
  - risk analysis on associated technical solutions
  - coarse analysis of financial risk

Rationale
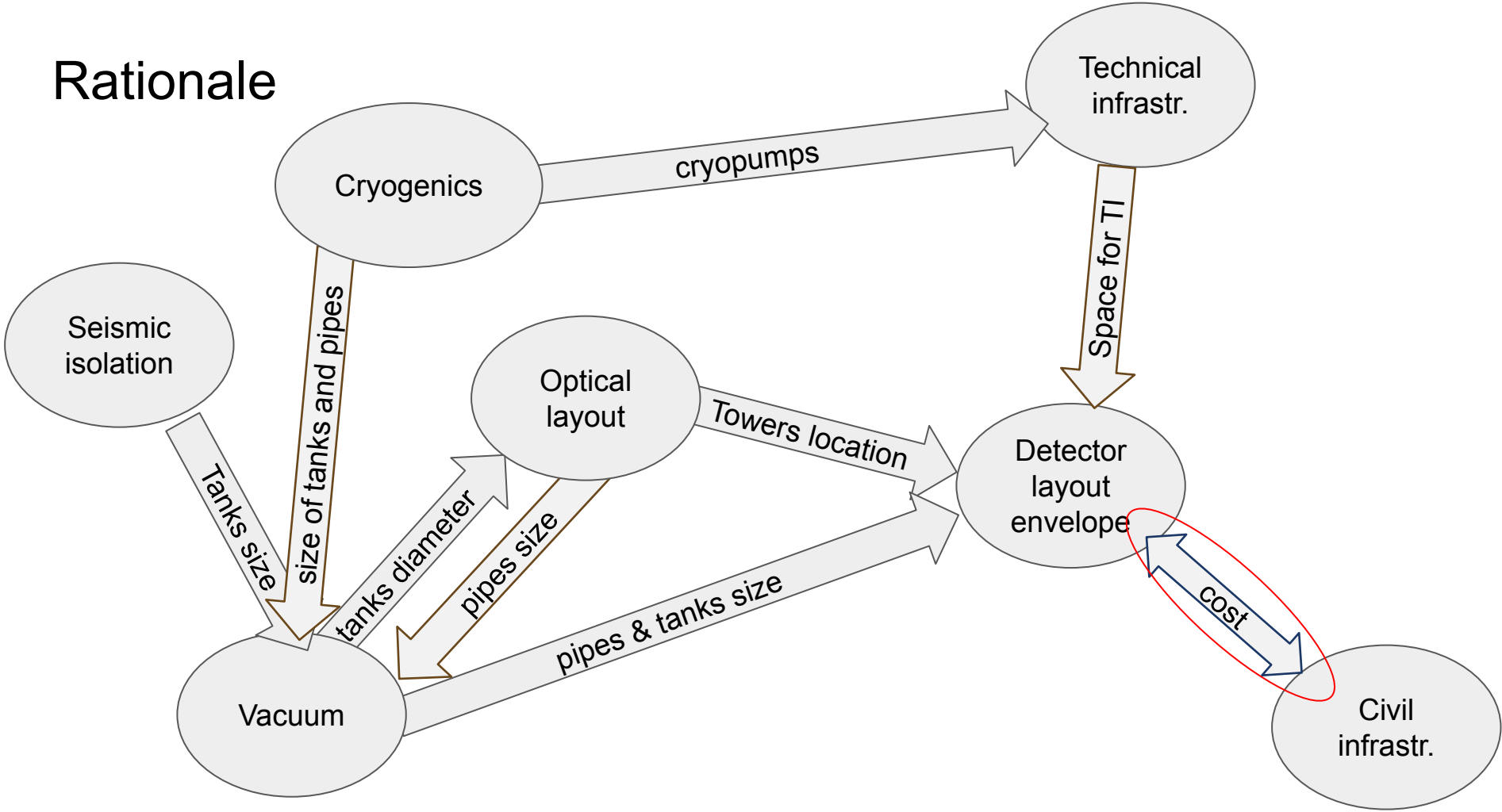
Rationale

1. Review baseline design and current options on triangle and L optical layout
2. Classify baseline design and current options for VAC, SUSP, CRYO
3. Identify constraints on optical layout from VAC, SUSP, CRYO (and viceversa)
4. **Identify most critical parameters for CE costing to drive choice of design options**
5. Define two sets of optical configurations
   - using baseline design for VAC, SUSP, CRYO
   - using options for VAC, SUSP, CRYO
   - include first principle cheap option(s)
6. Generate corresponding baseline and optional detector layouts
   - run consistent estimate of margins
7. Coarse evaluation of layout options on CE cost
8. Run a simplified risk analysis by options classification, e.g.:
   a) performance risk
   b) technical risk (technology readiness level)
   c) design flexibility
   d) financial risk
11. Generate parametrized detector layout based on classified options, according to risk analysis

Civil infrastructure cost breakdown estimation

- Needed to drive instrument configuration changes
  - assuming dominant cost will be given by civil infrastructure
  - instrument configuration will be changed according to the identification of most critical elements for cost of civil infrastructure
- Requires two sets of criteria
  - Derive coarse civil infrastructure layout from detector layout
  - Coarse cost estimate of individual elements of civil infrastructure