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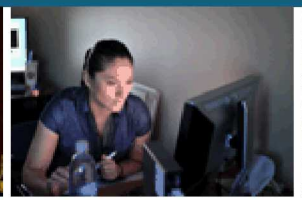
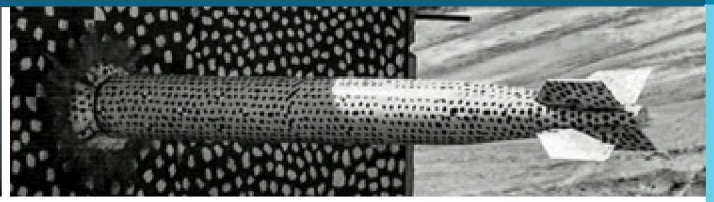
SAND2018-13397C

Use of multi attribute decision analysis models to characterize the WMD vulnerabilities of countries to help support global threat reduction actions





PRESENTED BY

Susan Caskey, Adam Williams, Barry Ezell

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Use of multi attribute decision analysis models to characterize the WMD vulnerabilities of countries to help support global threat reduction actions

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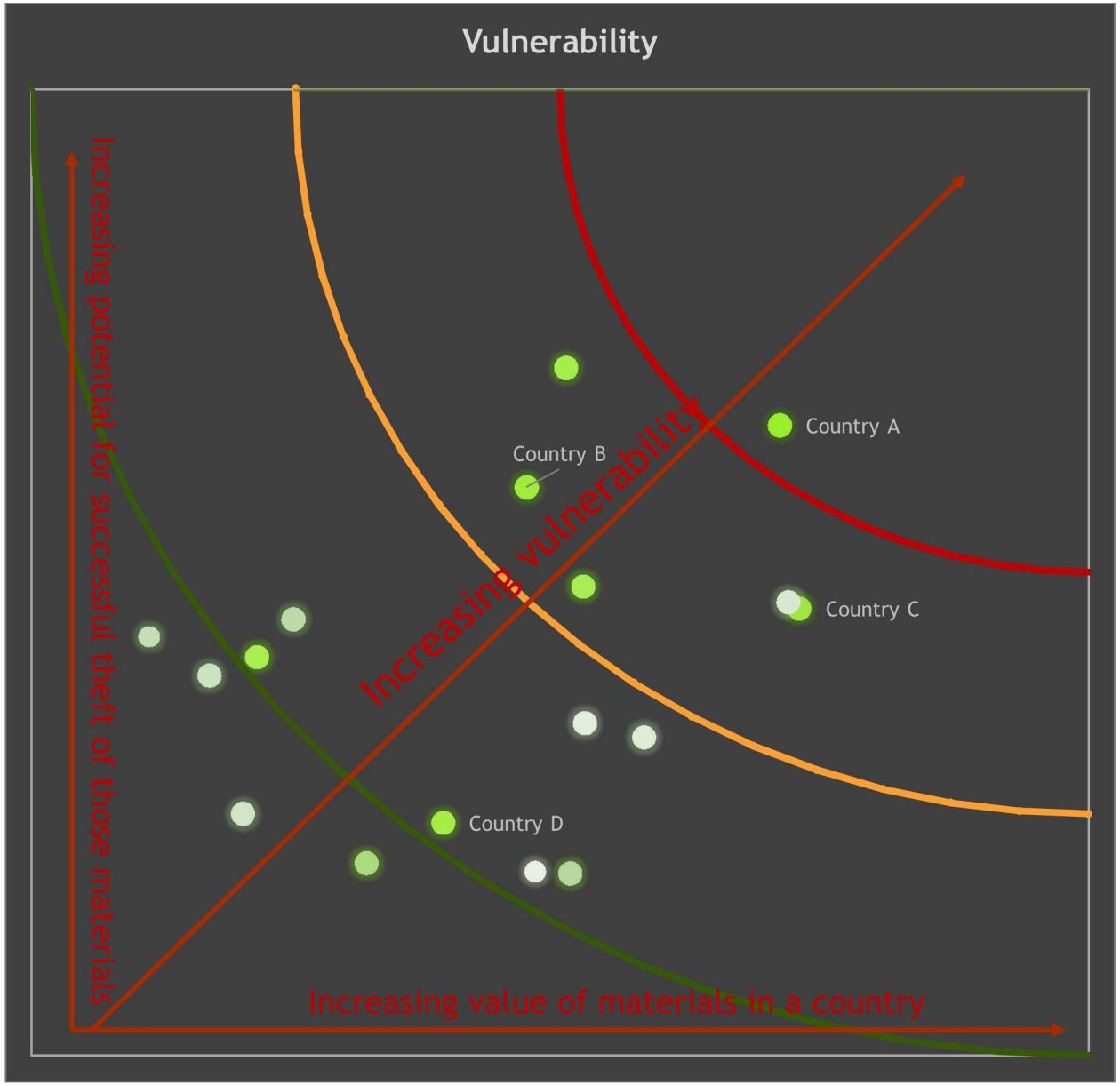
- Budgets are not infinite
- Not all counties have the same situations, problems, or needs

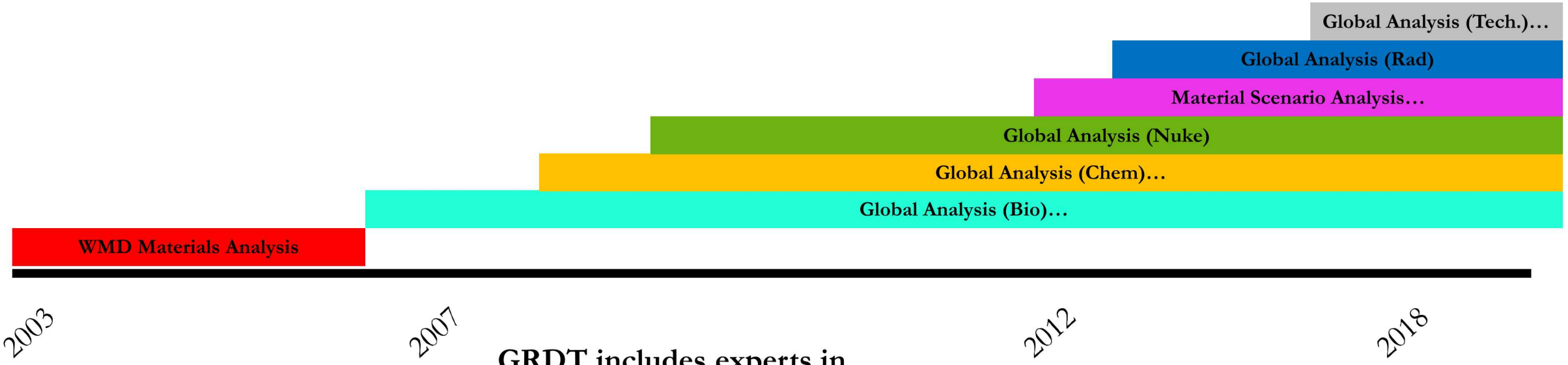
A multi attribute decision analysis model can structure country analysis and provide a framework for relative prioritization of countries

This type of modeling can be used to compare a large set of data points in a defensible and easy to communicate framework



Short Background

Sandia National Laboratories' ***Global Risk and Decision Analysis team (GRDT)*** has been providing risk and decision analysis support and tools for the last 15+ years



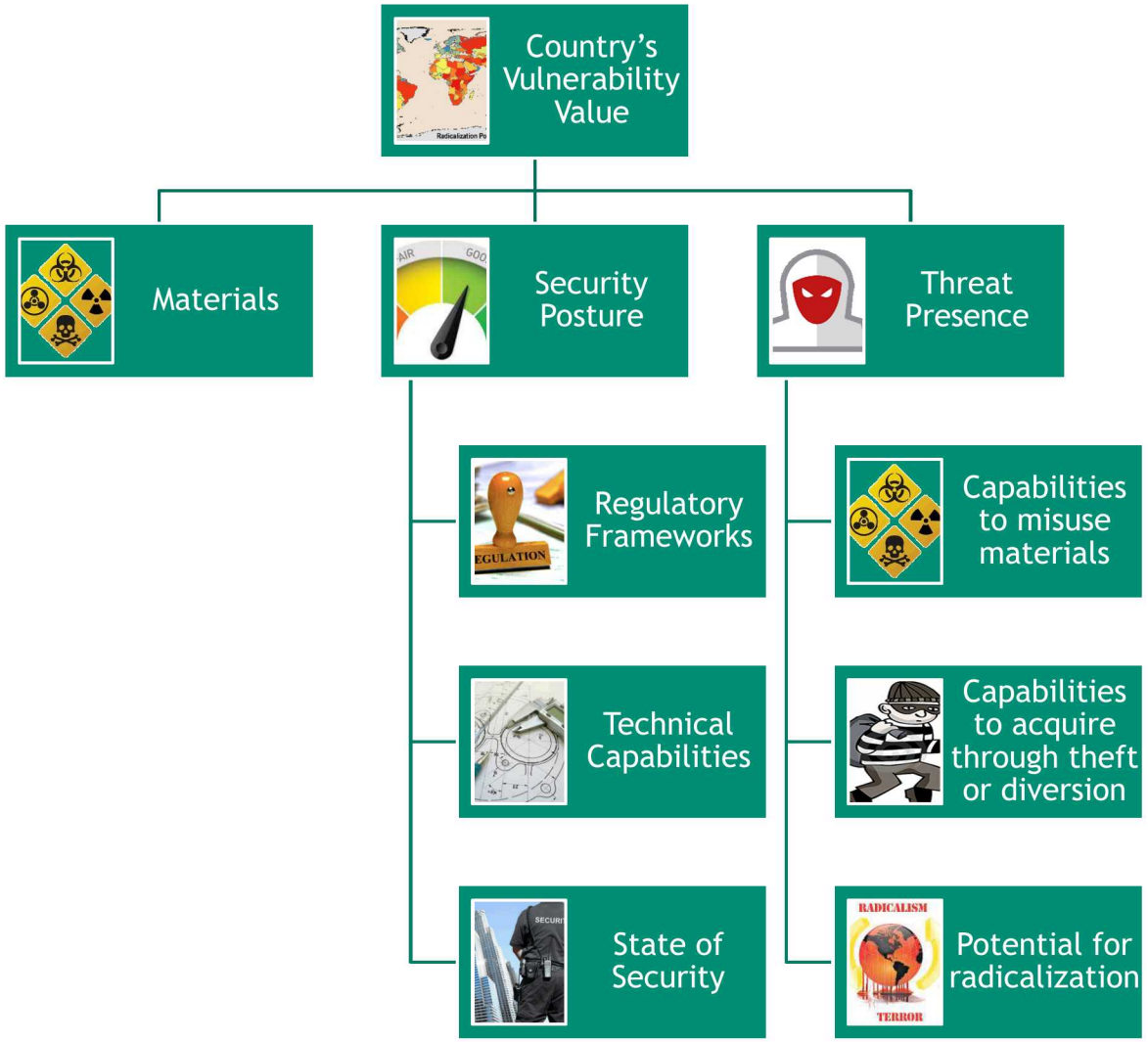
GRDT includes experts in

- Physical security
- International security
- Regulatory frameworks
- Public health
- Physics
- Chemistry
- Biology
- Computer scientists
- System engineers
- Statisticians
- Modeling/Simulation

How are we defining WMD Vulnerabilities?

Simply…

- What do they have that could be misused?
- How is it secured?
- Who might want to take it?

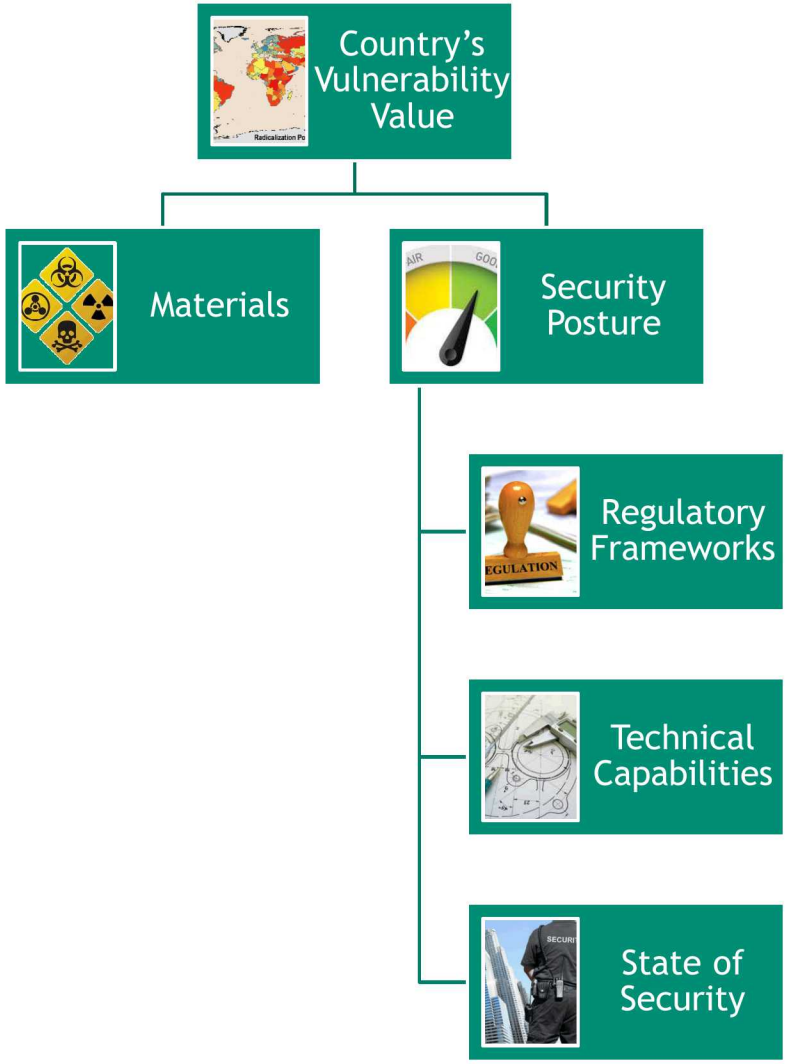


Narrowing the focus for today…

Current global threat reduction programs focus on

- Removal or reducing the material
- Enhancement of the security posture

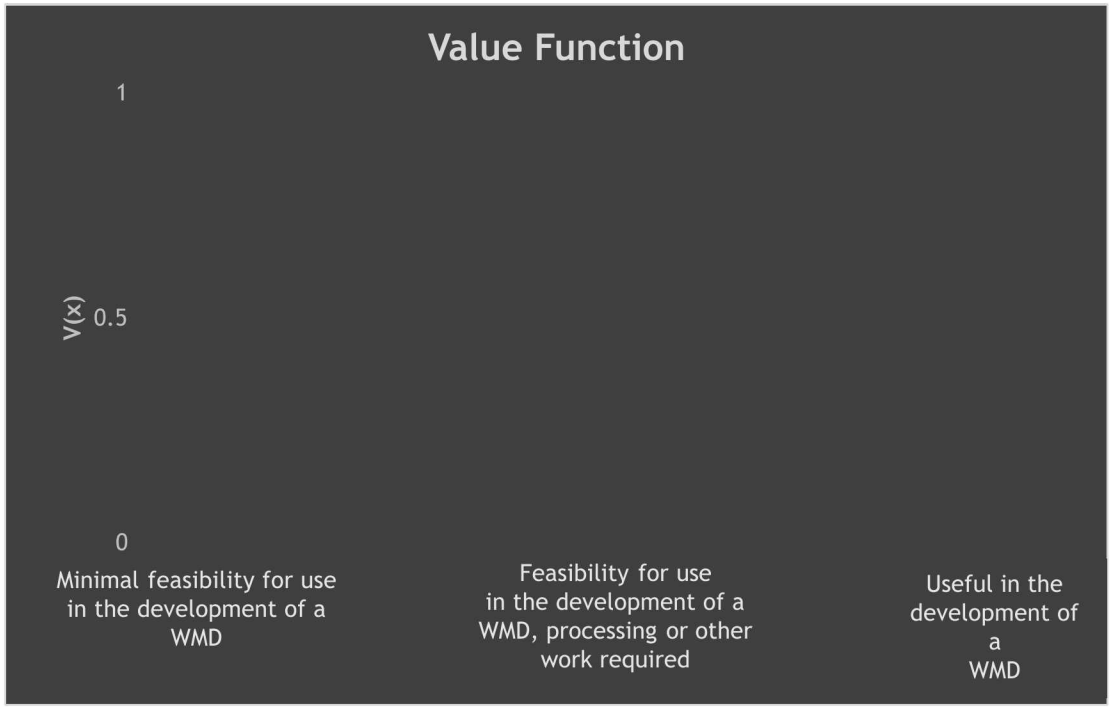
The threat helps to define where materials maybe targeted today, but as threats move and change, unsecured materials may be at risk anywhere

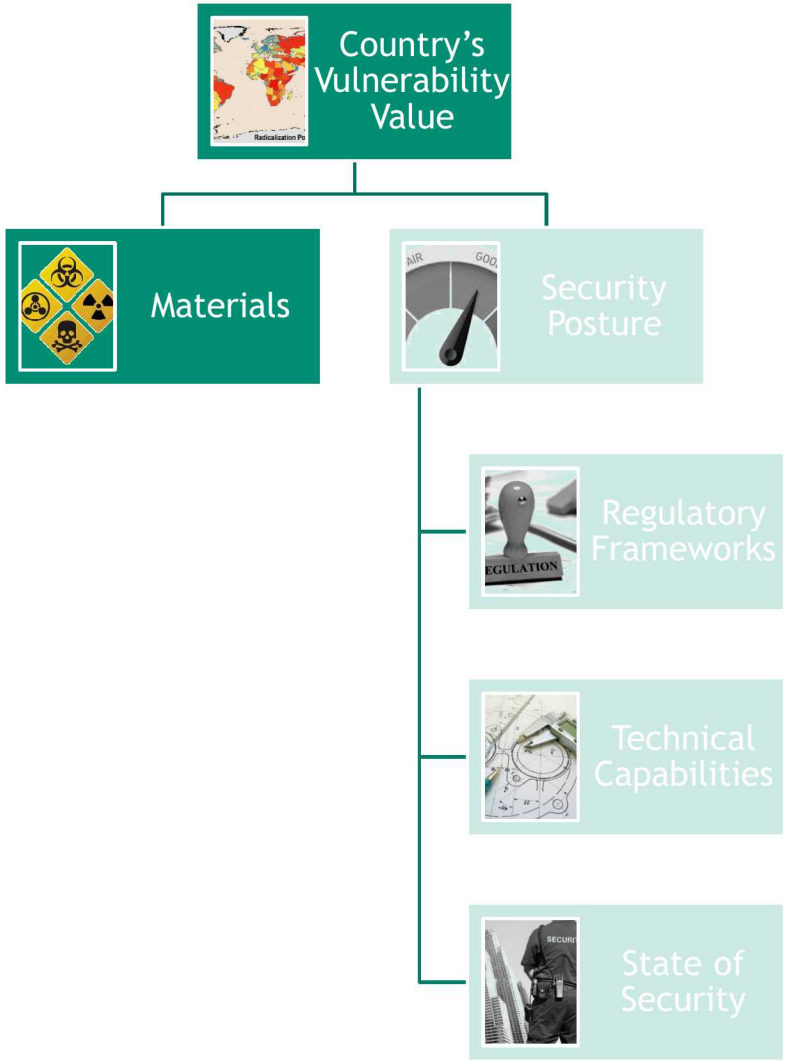


Materials

Potential ***impact*** of theft/misuse is a function of:

- Presence of WMD materials
- Value of defined WMD materials (e.g., type/quantity/state/form)





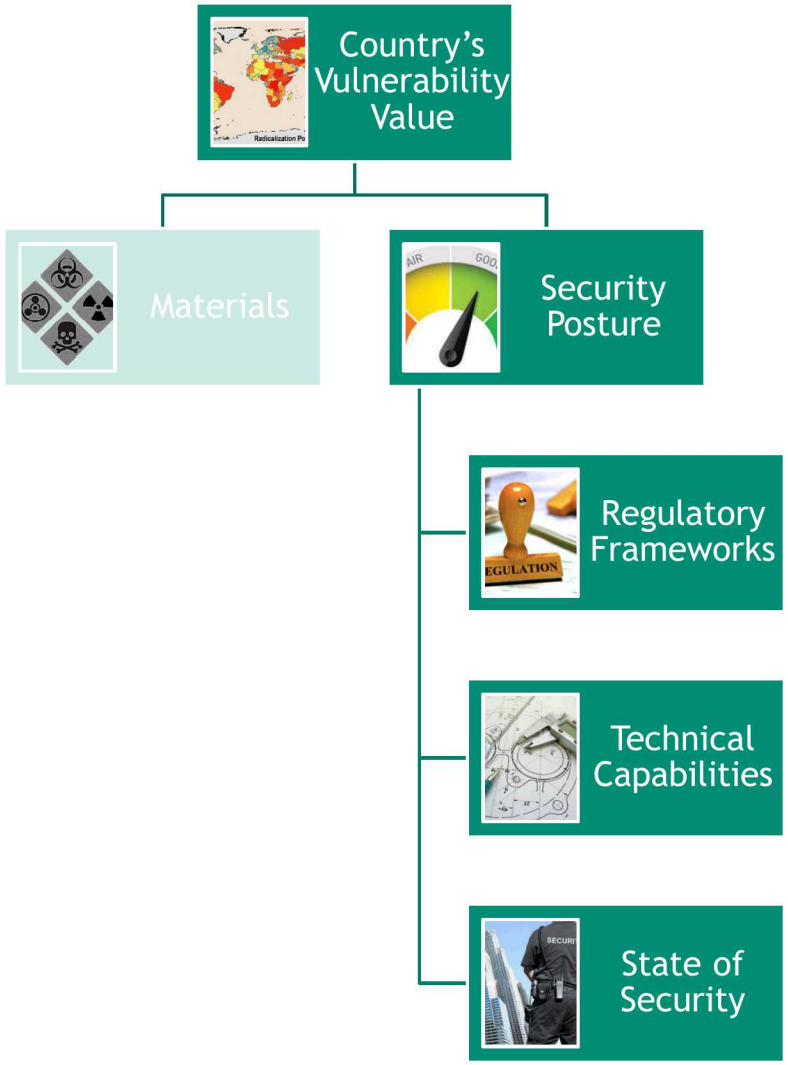
Security Posture

Security posture of the country ~ the ***maturity*** of measures that impact the overall security of the materials

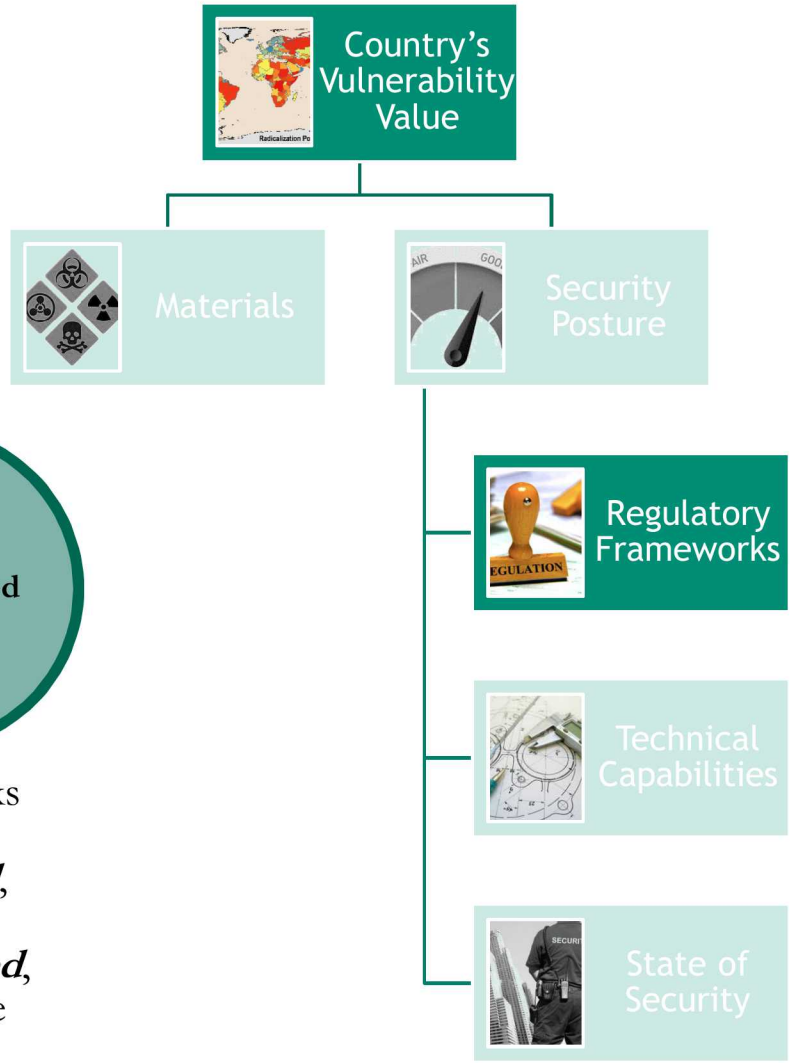
Regulatory Frameworks

Technical Capabilities

State of Security



Regulatory Framework Maturity Model*



1.Siloed

- Frameworks ***may exist,*** but are ***isolated*** and ***fragmented***

2.Transition

- Frameworks being ***improved*** to support more effective risk management

3.Managed

- Frameworks are ***robust*** and ***enforcement*** feasible

4.Transform

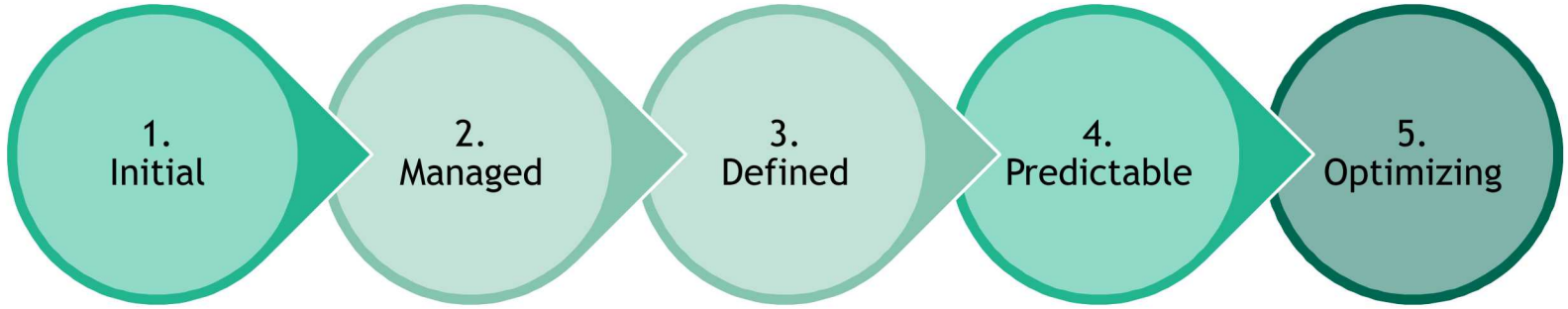
- Frameworks are ***robust***, ***enforcement exists***, and included in ***outreach initiatives***

5.Advantaged

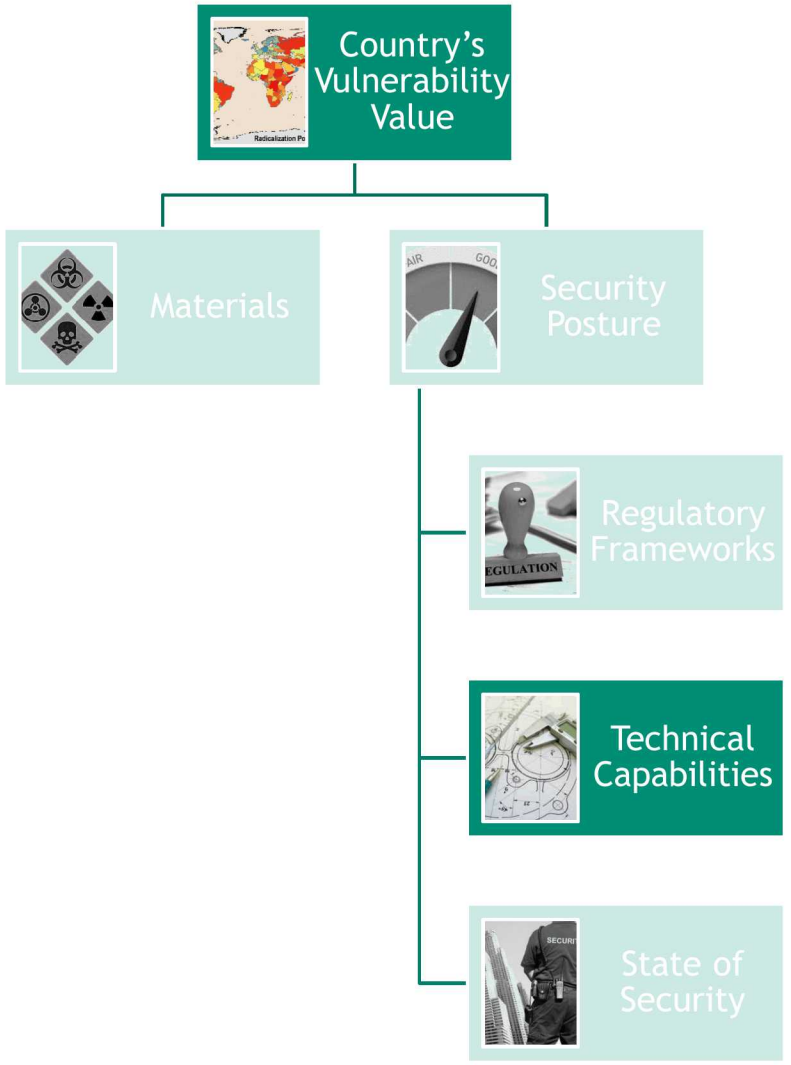
- Frameworks are ***optimized***, ***balanced***, ***maintained***, and include ***continual improvement***

**Based on the language of the RSA Archer Maturity Model*

Technical Capabilities Maturity Model*



- No security culture, ***limited***, ***unpredictable***, and ***poorly controlled*** technology
- ***Basic security awareness*** and ***generalized*** security processes
- ***Basic steps*** to implement a security culture and the abilities to ***implement standard security*** measures
- ***Advanced steps*** to support a security culture and the abilities to ***implement robust security*** measures
- ***Mature security culture*** exists, the abilities to ***implement robust security*** measures and ***continual improvement***



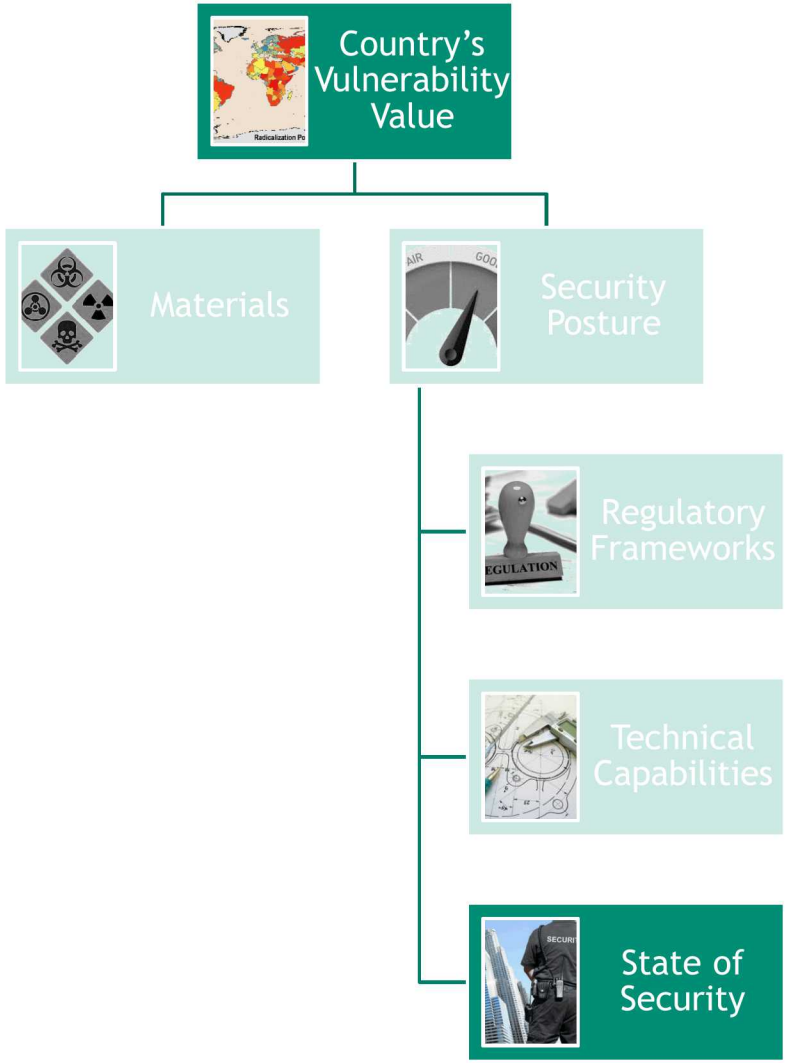
*Definitions were based upon discussions with subject experts on creating security cultures and reviewing the Carnegie Mellow People Capability Maturity Model (P - CMM)

State of Security Maturity Model

Designed to focus on all pillars of security and risk management

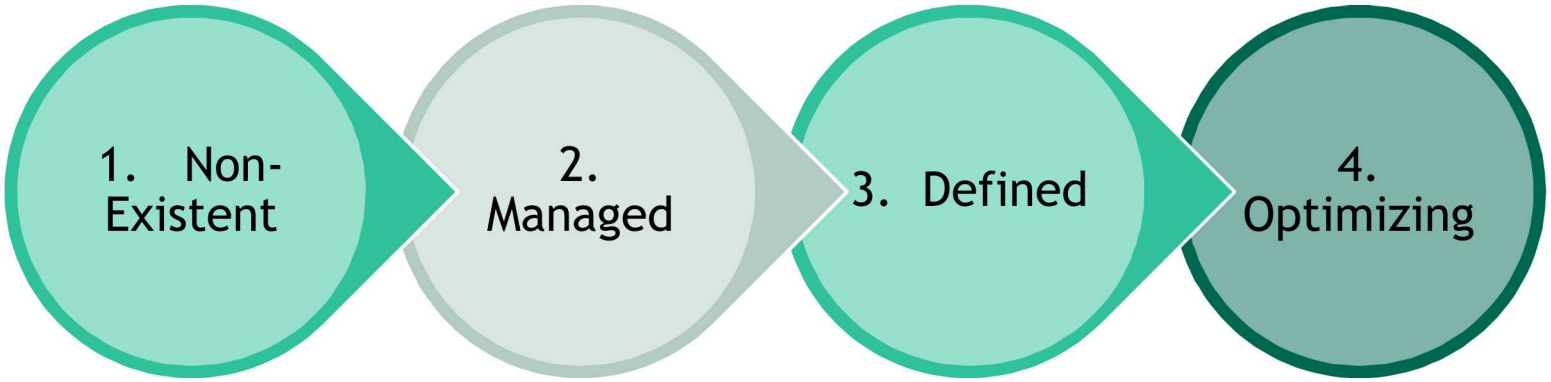
Organizational Risk Management

- Physical Security
- Human Reliability Programs
- Material Control and Accountability
- Transport Security
- Cyber Security

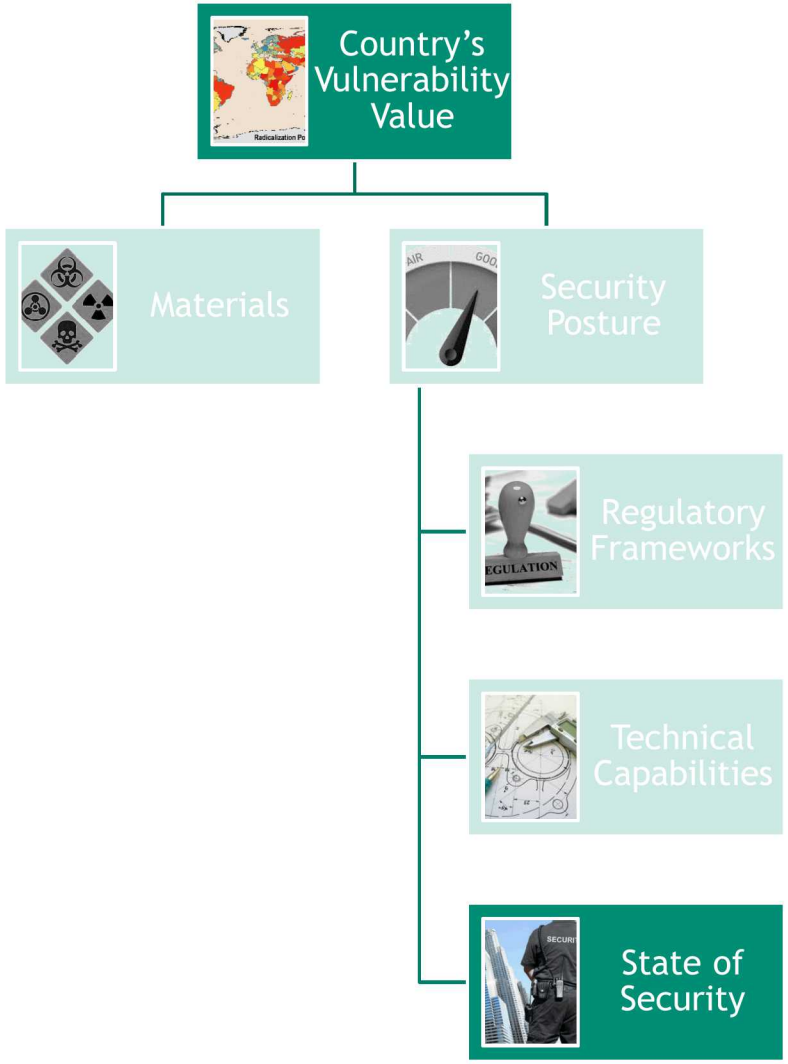


Defined leveraging language from cyber security maturity models (C2M2)

State of Security Maturity Model*



- ***No security measures*** identified, ***deterrence*** may exist but is ***limited***
- Threats/risks identified, but ***security measures*** are ***compliance based*** and ***ad hoc***
- Threats/risks identified, and ***security measures*** are ***robust***, ***structured***, and ***follow best practices***
- Threats/risks identified, and ***security measures*** are ***robust***, ***structured***, ***follow best practices***, and includes ***robust management level support***



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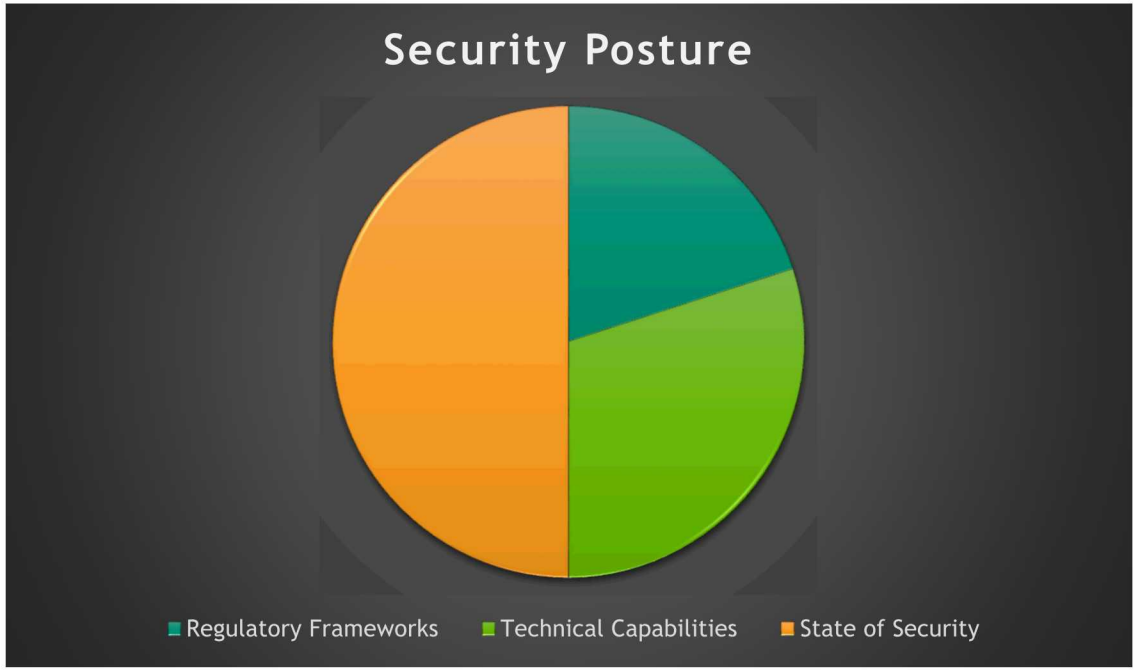
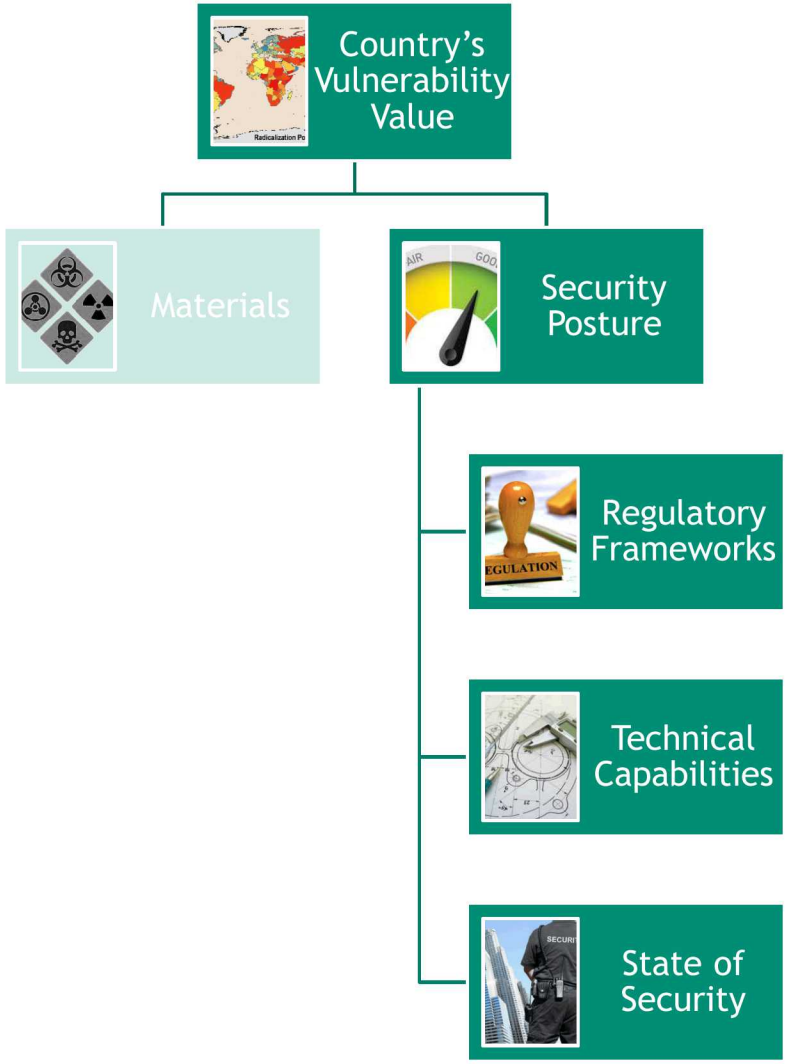
Security Posture

The levels of maturity are given values (zero to one) and combine using a weighted average to define the country's security posture value





Country Assessment - Hydrozastan

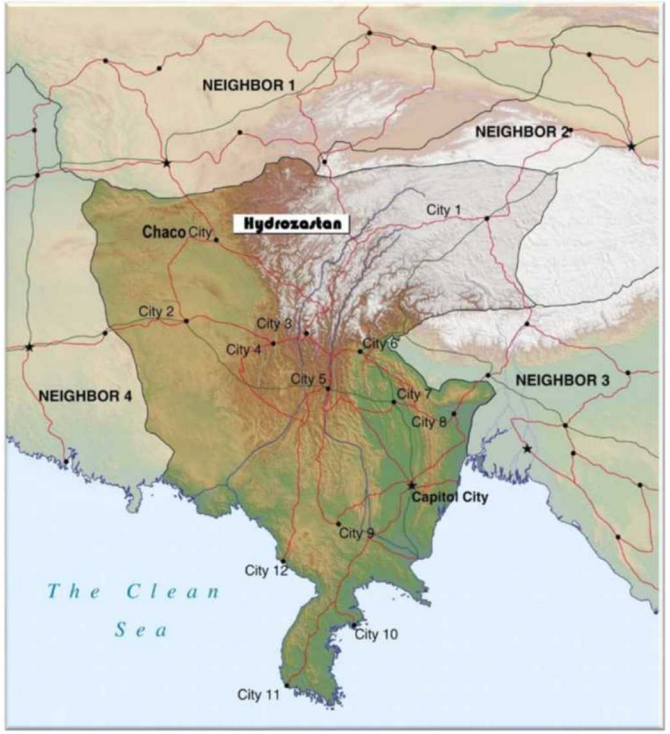
Some dual-use chemicals are imported, used, stored, and disposed (specifically at Chaco City Chemical)

Import/Export regulations exist for dual-use chemicals

No regulations regarding transport, storage, use, or disposal

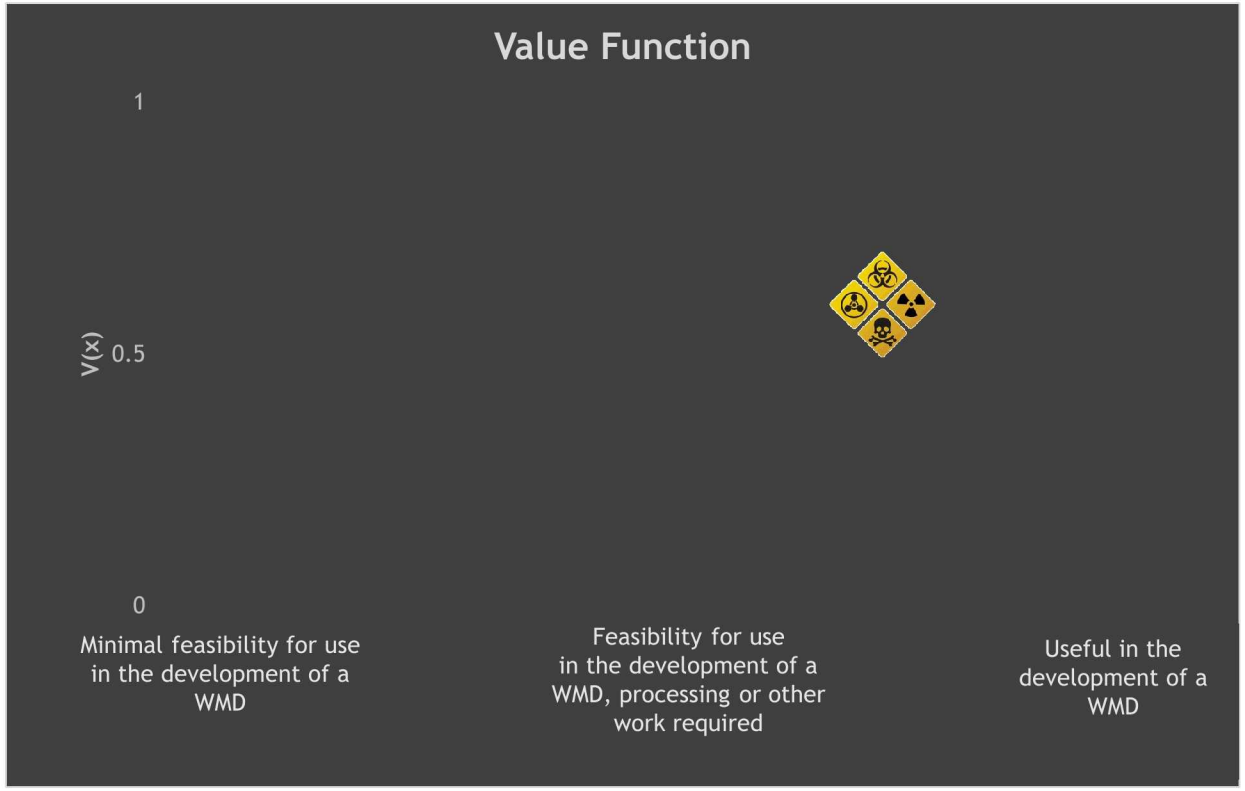
Sites assessment highlight security existing at facilities but mostly based on perimeters and CCTV cameras

Chemical associations promote chemical safety but have only just started to include security in their education, those with security expertise are very limited



Hydrozastan - Materials

Dual use chemicals are useful in the development of a WMD, but due to the small quantity existing do not receive the full value of 1, but rather a .6



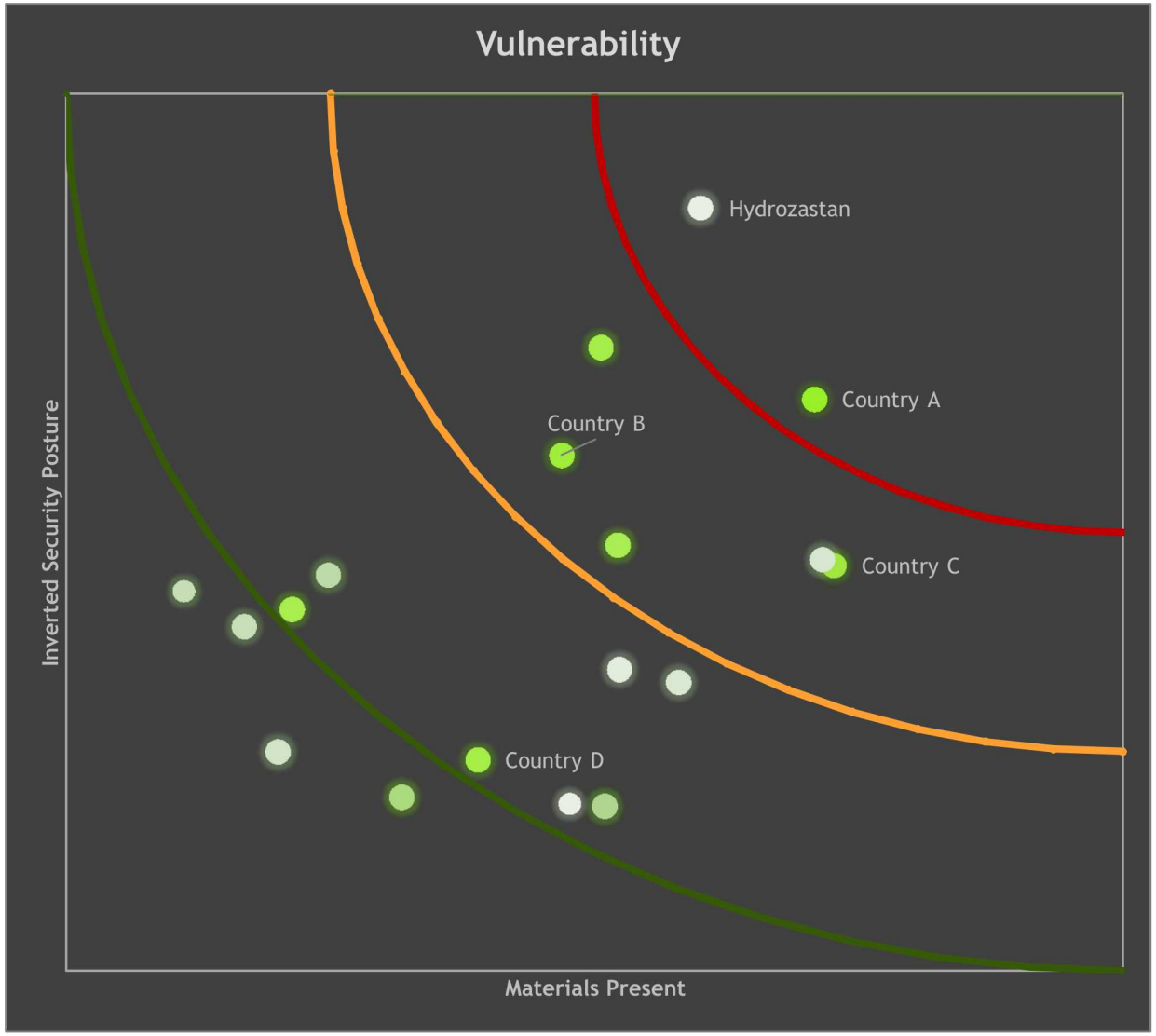
Hydrozastan – Security Posture

Regulatory Framework – Siloed

Technical Capabilities – Managed

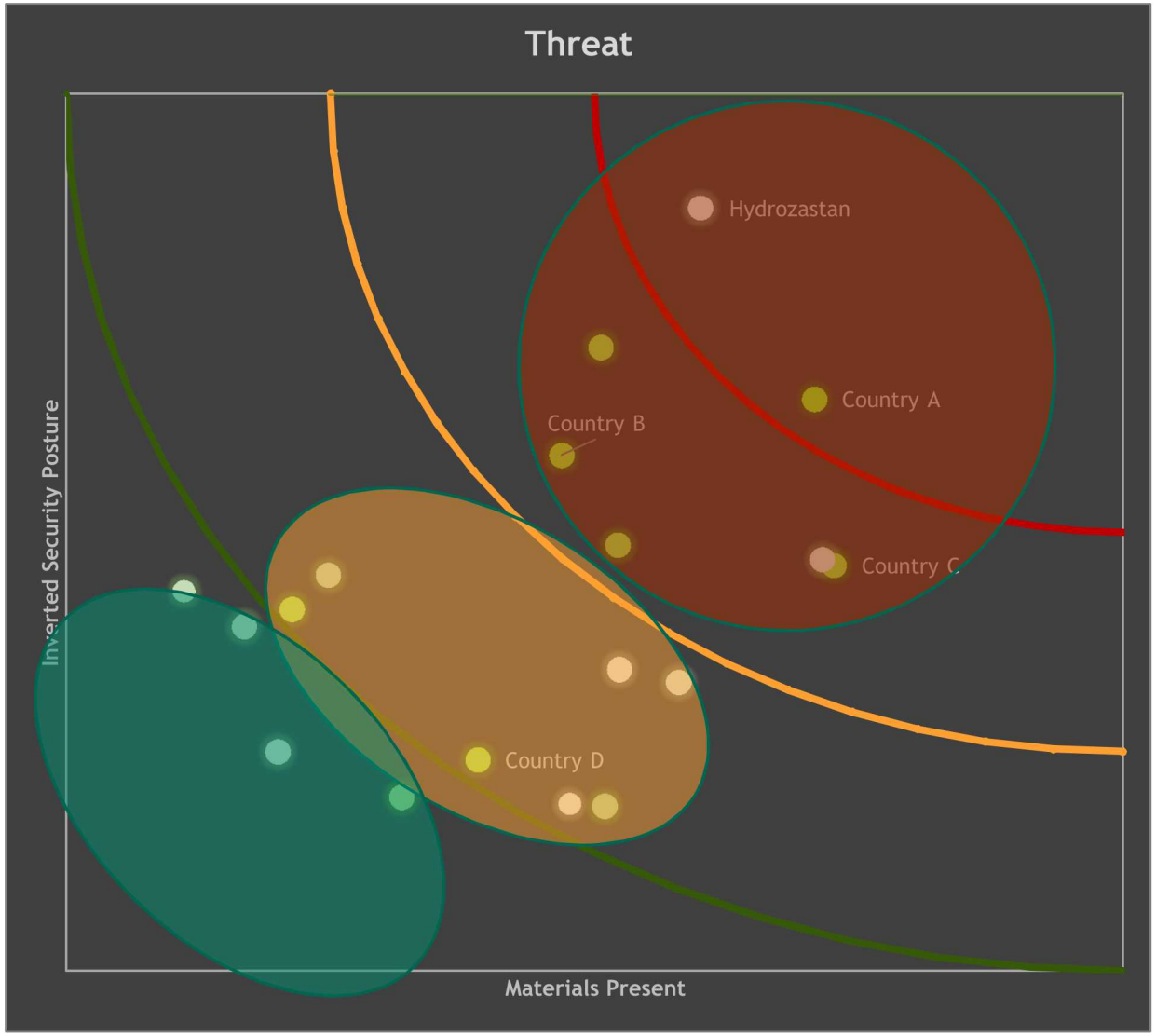
State of Security - Managed

Overall security posture .13 out of 1



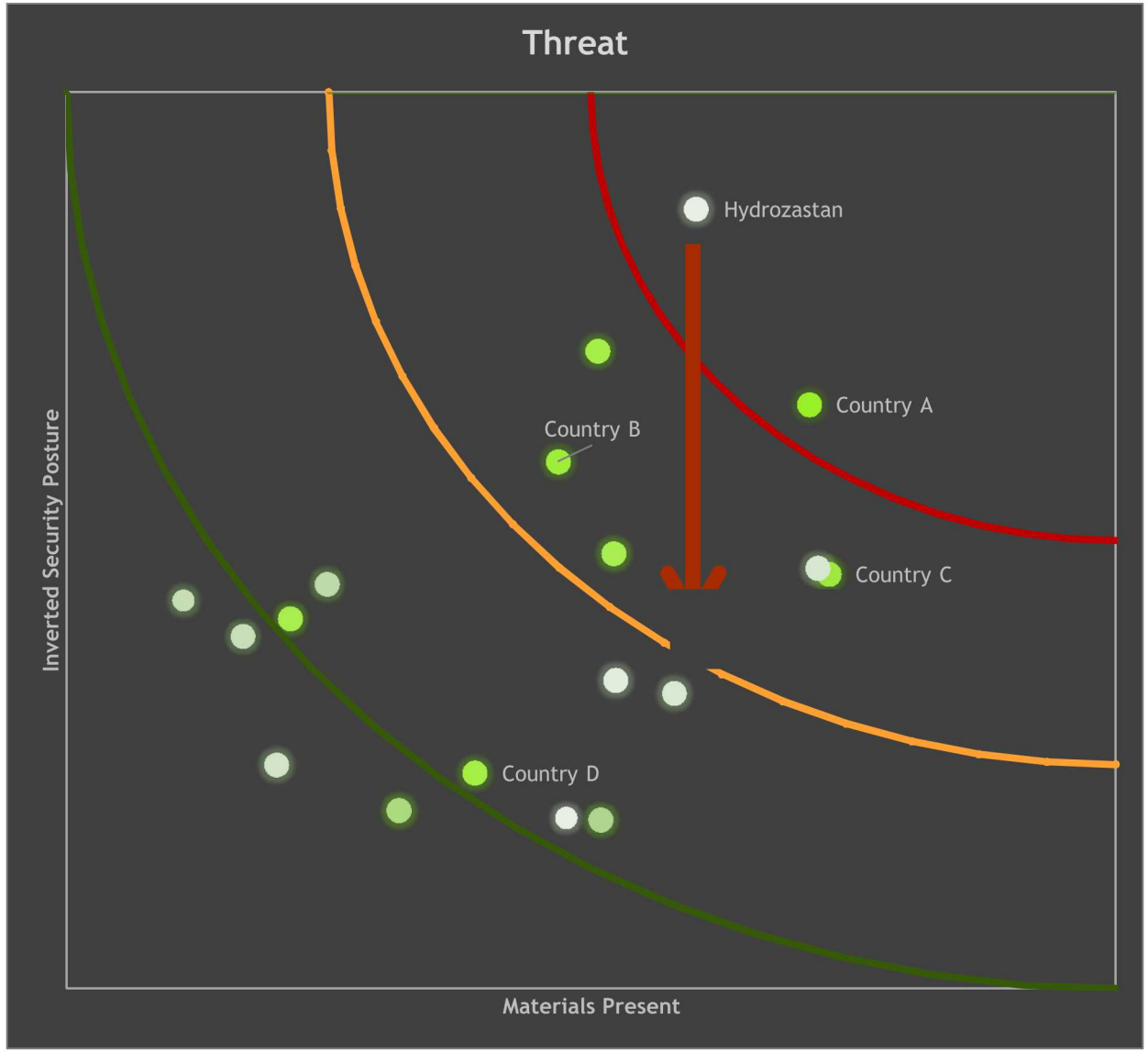
Engagement Priorities

Tier I	**Countries with Materials with WMD potential and gaps in their security posture**	**Work to improve security and/or reduce materials**
Tier II	Countries with Materials but a better Security Posture	Partner with countries
Tier III	Countries with no notable Materials	Little engagement needed



Changes over time - Hydrozastan

Engagement Strategies	Implemented Measured
Regulatory Framework Changes	No changes Regulatory frameworks (Siloed)
Technical Capabilities Expansion	Increased education and outreach on chemical security with chemical associations (Defined)
State of Security Enhancement	Increased security of the sites with the dual-use chemicals (Defined)
Updated security posture 0.6 out of 1	



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