

# NTI Nuclear Security Index & Radioactive Source Security Assessment

Briefing for the European Regional Transport Security Series:  
Threats to Nuclear and Radioactive Materials during Transport

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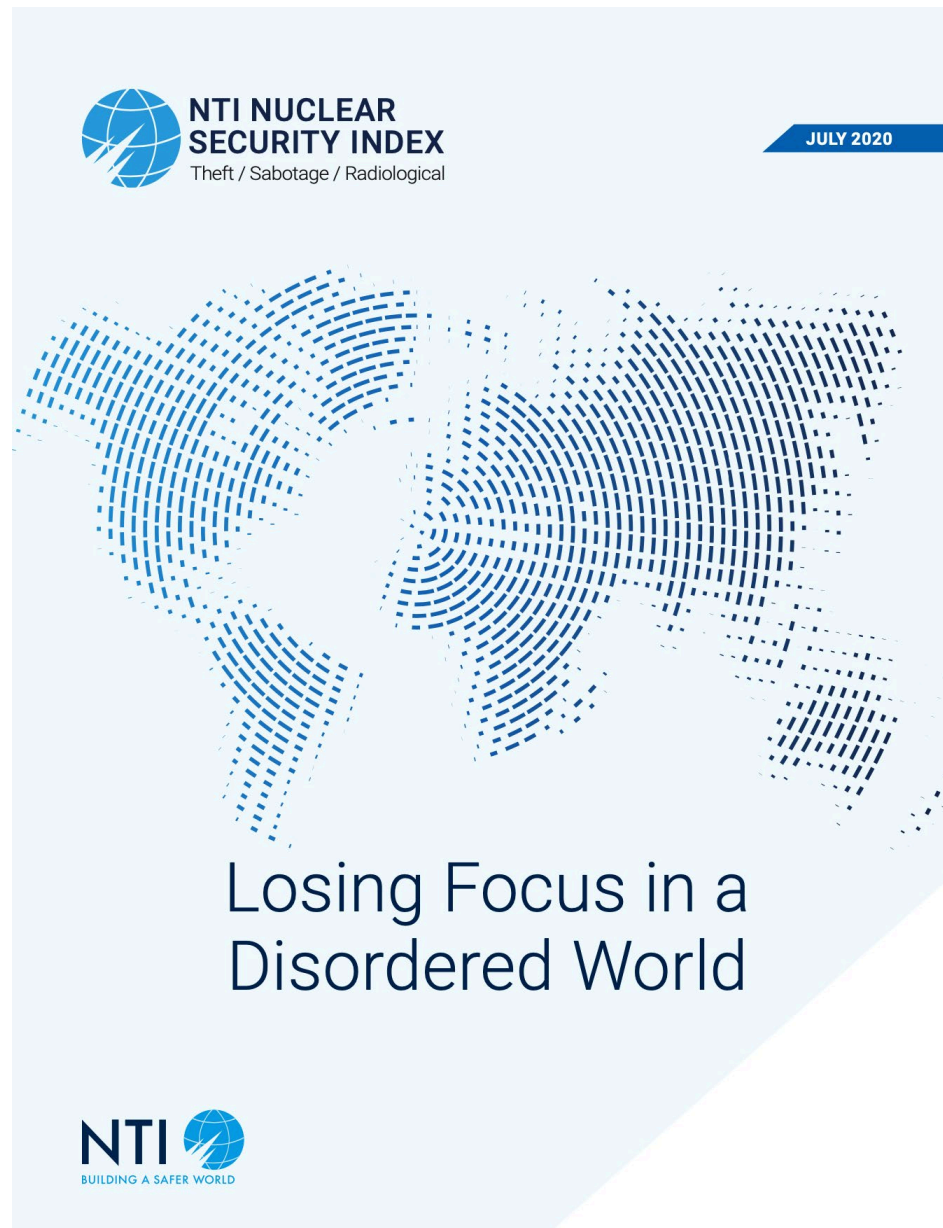
# The NTI Index



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# About the NTI Index



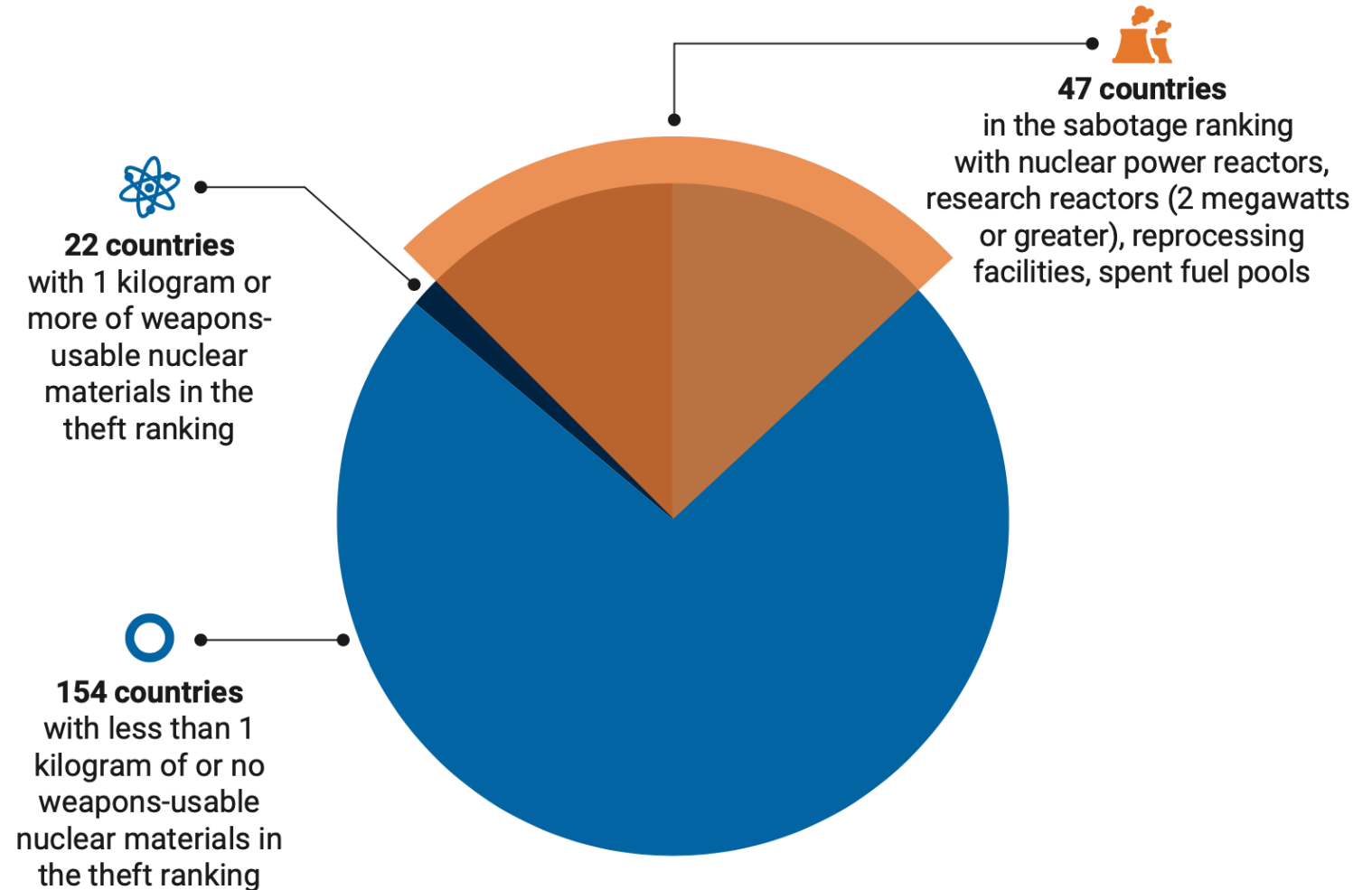
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# NTI Index Goals

- Track progress, identify gaps and challenges, promote action.
- Reflect evolutions in nuclear security practice, priorities, policy trends, and threats.
- Drive ambition and reflect the need for continuous improvement.

# About the Rankings

## Countries in the NTI Index



# The Index Methodology

## KEY FACTS ABOUT THE NTI INDEX



**Serves as  
an objective  
assessment of  
nuclear security  
conditions  
around the world**



**Data gathered  
from publicly  
available  
information**



**Researched by  
the Economist  
Intelligence Unit**



**Advised by an  
international  
panel of experts**



**Government  
input provided  
through data  
confirmation**

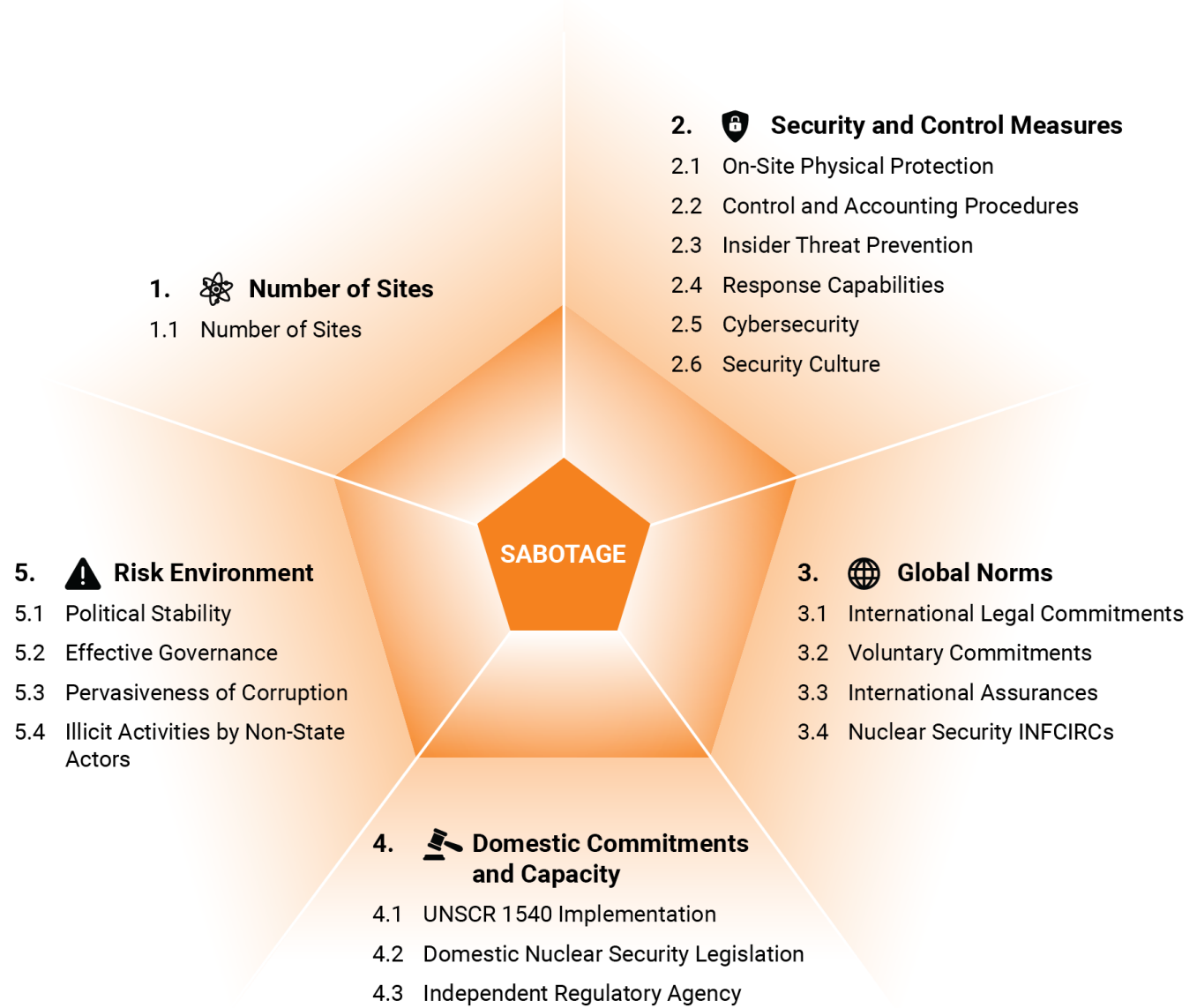
# Index Framework: Theft/Secure Materials

## How the Theft Ranking Measures Nuclear Security Conditions



# Index Framework: Sabotage

## How the Sabotage Ranking Measures Nuclear Security Conditions





# Top Level Findings: Nuclear Security Index

1. Nuclear security progress has **slowed** in the past two years.
2. Domestic nuclear security regulations remain **weak**.
3. There are major **gaps** in the global nuclear security architecture.

# Theft Ranking: Spotlight on Europe

All countries with 1kg or more of weapons-usable nuclear materials are in the sabotage ranking *except Belarus and Italy*

OVERALL SCORE		
Rank / 22	Score	Δ
1 Australia	93	+1
=2 Canada	87	0
=2 Switzerland	87	+3
4 Germany	85	+3
=5 Netherlands	82	+1
=5 Norway	82	+4
7 Belgium	80	+3
8 Japan	77	-1
=9 United Kingdom	76	0
=9 United States	76	0
11 Italy	75	0
=12 France	69	-1
=12 Kazakhstan	69	+1
=14 Belarus	65	0
=14 China	65	0
=16 Israel	57	0
=16 Russia	57	+1
=16 South Africa	57	+1
19 Pakistan	47	+7
20 India	41	0
21 Iran	33	0
22 North Korea	19	+1

GLOBAL NORMS		
Rank / 22	Score	Δ
=1 Australia	96	+4
=1 Japan	96	+2
=1 United States	96	-2
4 Norway	94	+4
5 Belgium	93	0
=6 Canada	92	0
=6 Germany	92	0
=6 United Kingdom	92	0
9 Switzerland	87	+4
=10 Kazakhstan	85	0
=10 Netherlands	85	0
12 France	84	0
13 Italy	83	0
14 China	72	-2
15 India	67	0
16 Russia	56	+2
17 Israel	54	-3
18 South Africa	52	+2
19 Belarus	47	0
20 Pakistan	45	+1
21 Iran	27	0
22 North Korea	0	0

1) QUANTITIES AND SITES		
Rank / 22	Score	Δ
1 Switzerland	95	0
2 Australia	94	0
=3 Iran	89	0
=3 Norway	89	0
=5 Belarus	75	0
=5 South Africa	75	0
=7 Belgium	72	0
=7 Canada	72	0
=7 Germany	72	0
=7 Kazakhstan	72	0
=11 Italy	70	0
=11 Netherlands	70	0
13 Israel	47	0
14 Japan	42	-6
=15 China	33	0
=15 France	33	0
=15 North Korea	33	0
18 United States	25	0
=19 India	19	0
=19 Pakistan	19	0
=19 Russia	19	0
22 United Kingdom	14	0

4) DOMESTIC COMMITMENTS AND CAPACITY		
Rank / 22	Score	Δ
=1 Australia	100	0
=1 Canada	100	0
=1 France	100	0
=1 Germany	100	+11
=1 Italy	100	0
=1 Japan	100	0
=1 Netherlands	100	0
=1 Norway	100	+11
=1 Russia	100	0
=1 Switzerland	100	+11
=1 United Kingdom	100	0
=1 United States	100	0
=13 Israel	95	0
=13 Kazakhstan	95	0
=15 Belgium	89	0
=15 China	89	0
=15 Pakistan	89	0
=18 Belarus	78	0
=18 South Africa	78	0
20 India	36	0
21 Iran	5	0
22 North Korea	0	0

2) SECURITY AND CONTROL MEASURES		
Rank / 22	Score	Δ
1 United Kingdom	96	0
2 United States	89	0
3 Canada	88	0
4 Australia	87	0
=5 China	80	0
=5 Germany	80	0
7 Italy	76	0
8 Belgium	75	+8
=9 Japan	74	0
=9 Netherlands	74	0
=11 Belarus	72	0
=11 Switzerland	72	0
13 Russia	70	0
14 France	64	0
=15 Kazakhstan	57	0
=15 Pakistan	57	+25
17 Norway	47	0
=18 India	44	0
=18 Israel	44	0
20 South Africa	36	0
21 North Korea	27	0
22 Iran	26	0

5) RISK ENVIRONMENT		
Rank / 22	Score	Δ
1 Norway	94	+2
2 Switzerland	88	0
3 Australia	87	0
4 Canada	83	0
=5 Germany	81	+3
=5 Netherlands	81	+2
7 Japan	75	0
8 United Kingdom	73	+5
9 Belgium	71	+2
10 France	66	-6
11 United States	63	+4
12 South Africa	53	+4
=13 Belarus	48	-2
=13 Israel	48	-1
15 China	44	+4
16 Italy	41	+4
17 India	39	+1
18 Kazakhstan	36	+6
19 North Korea	34	+5
20 Russia	29	+3
21 Iran	18	-1
22 Pakistan	16	0

# Sabotage Ranking: Spotlight on Europe (1/2)

\*All countries with 1kg or more of weapons-usable nuclear materials are in the sabotage ranking *except Belarus and Italy*

OVERALL SCORE		
Rank / 47	Score	Δ
1 Australia	92	+1
2 Canada	90	0
3 Finland	89	0
4 United Kingdom	88	+1
=5 Germany	84	+3
=5 Hungary	84	-1
=7 Netherlands	83	+1
=7 United States	83	0
=9 Czech Republic	82	+1
=9 Japan	82	+1
=9 Romania	82	+1
=9 Sweden	82	+1
=9 Switzerland	82	+3
=14 Norway	81	+3
=14 Slovenia	81	+2
16 Belgium	80	+3
17 Poland	78	0
=18 France	77	-1
=18 South Korea	77	0
=18 United Arab Emirates	77	n/a
21 Bulgaria	75	+8
=22 China	74	+1
=22 Spain	74	0
24 Slovakia	73	+4
=25 Indonesia	69	0
=25 Kazakhstan	69	+1
27 Argentina	68	-2
28 Armenia	67	0
29 Ukraine	65	0
30 Russia	64	+1
31 Israel	61	-1
32 Chile	60	+2
33 Pakistan	58	+5
34 Morocco	57	+1
35 South Africa	56	+1
36 Uzbekistan	55	+2
37 Mexico	54	+1
=38 India	53	0
=38 Jordan	53	n/a
=38 Taiwan	53	0
41 Peru	52	+1
42 Brazil	47	0
43 Bangladesh	45	+1
44 Algeria	42	-2
45 Egypt	40	-2
46 Iran	21	0
47 North Korea	17	+1

1) NUMBER OF SITES		
Rank / 47	Score	Δ
=1 Algeria	100	0
=1 Armenia	100	0
=1 Australia	100	0
=1 Bangladesh	100	0
=1 Bulgaria	100	0
=1 Chile	100	0
=1 Egypt	100	0
=1 Israel	100	0
=1 Jordan	100	n/a
=1 Mexico	100	0
=1 Morocco	100	0
=1 Peru	100	0
=1 Poland	100	0
=1 Slovenia	100	0
=1 United Arab Emirates	100	n/a
=1 Uzbekistan	100	0
=17 Argentina	80	0
=17 Brazil	80	0
=17 Czech Republic	80	0
=17 Finland	80	0
=17 Hungary	80	0
=17 Indonesia	80	0
=17 Iran	80	0
=17 Kazakhstan	80	0
=17 Netherlands	80	0
=17 North Korea	80	0
=17 Norway	80	0
=17 Pakistan	80	0
=17 Romania	80	0
=17 Slovakia	80	0
=17 South Africa	80	0
=32 Belgium	60	0
=32 Canada	60	0
=32 India	60	0
=32 South Korea	60	0
=32 Spain	60	0
=32 Sweden	60	0
=32 Switzerland	60	0
=32 Taiwan	60	0
=32 Ukraine	60	0
=41 China	40	0
=41 Germany	40	0
=41 United Kingdom	40	0
=44 France	20	0
=44 Japan	20	0
=44 Russia	20	0
47 United States	0	0

2) SECURITY AND CONTROL MEASURES		
Rank / 47	Score	Δ
1 United Kingdom	95	0
2 United States	88	0
=3 Australia	87	0
=3 Canada	87	0
5 Finland	86	+3
6 Hungary	83	0
7 Romania	80	0
8 China	79	0
=9 Bulgaria	77	+16
=9 Germany	77	0
11 Czech Republic	74	0
12 Japan	73	0
13 Belgium	72	+9
=14 Netherlands	69	0
=14 Slovenia	69	+4
=14 Switzerland	69	0
17 Taiwan	68	+2
18 Russia	67	0
=19 South Korea	66	0
=19 Ukraine	66	0
=21 Poland	65	+4
=21 United Arab Emirates	65	n/a
=23 Armenia	63	0
=23 Sweden	63	0
25 France	59	0
=26 Pakistan	56	+15
=26 Slovakia	56	+4
28 Spain	55	0
=29 Indonesia	53	0
=29 Kazakhstan	53	0
31 India	52	0
32 Norway	49	0
33 Jordan	46	n/a
=34 Argentina	45	0
=34 Peru	45	0
36 Brazil	43	+7
37 Uzbekistan	41	0
38 South Africa	40	0
39 Israel	36	0
40 Chile	35	0
41 Algeria	32	0
=42 Iran	23	0
=42 North Korea	23	0
44 Mexico	21	0
45 Egypt	19	0
46 Bangladesh	17	0
47 Morocco	16	0

# Sabotage Ranking: Spotlight on Europe (2/2)

\*All countries with 1kg or more of weapons-usable nuclear materials are in the sabotage ranking *except Belarus and Italy*

## 3) GLOBAL NORMS

Rank / 47	Score	Δ
1 France	97	0
=2 Australia	94	+4
=2 Canada	94	0
=2 Japan	94	+3
=2 Mexico	94	+3
=2 Poland	94	0
=2 Sweden	94	0
=2 Ukraine	94	0
=2 United States	94	-3
10 Belgium	93	0
=11 Norway	91	0
=11 United Kingdom	91	0
13 Romania	90	+6
=14 Finland	88	-3
=14 Germany	88	0
=14 South Korea	88	-3
17 Indonesia	86	+4
=18 Hungary	85	-3
=18 Kazakhstan	85	0
=18 Netherlands	85	0
=18 Spain	85	0
=22 Chile	84	0
=22 China	84	0
=22 Czech Republic	84	0
=22 Switzerland	84	+5
26 United Arab Emirates	83	n/a
=27 India	81	0
=27 Jordan	81	n/a
=29 Morocco	78	+4
=29 Slovenia	78	+3
31 Argentina	76	-4
32 Armenia	74	-3
33 Russia	64	+3
34 Slovakia	63	+6
35 Algeria	60	-4
=36 Brazil	59	-2
=36 Bulgaria	59	+4
=36 Israel	59	-4
39 Pakistan	58	0
40 Peru	56	-3
41 South Africa	51	0
42 Bangladesh	50	+4
43 Uzbekistan	47	+3
44 Egypt	29	-4
45 Taiwan	22	-3
46 Iran	14	0
47 North Korea	0	0

## 4) DOMESTIC COMMITMENTS AND CAPACITY

Rank / 47	Score	Δ
=1 Argentina	100	0
=1 Australia	100	0
=1 Bulgaria	100	+11
=1 Canada	100	0
=1 Czech Republic	100	0
=1 Finland	100	0
=1 France	100	0
=1 Germany	100	+11
=1 Hungary	100	0
=1 Indonesia	100	0
=1 Israel	100	0
=1 Japan	100	0
=1 Kazakhstan	100	0
=1 Netherlands	100	0
=1 Norway	100	+11
=1 Romania	100	0
=1 Russia	100	0
=1 Slovakia	100	0
=1 Slovenia	100	0
=1 Spain	100	0
=1 Switzerland	100	+11
=1 United Kingdom	100	0
=1 United States	100	0
=24 Armenia	89	0
=24 Belgium	89	0
=24 China	89	0
=24 Morocco	89	0
=24 Pakistan	89	0
=24 Poland	89	0
=24 South Korea	89	0
=24 Sweden	89	0
=24 United Arab Emirates	89	n/a
=24 Uzbekistan	89	0
34 Bangladesh	84	0
=35 South Africa	78	0
=35 Ukraine	78	0
37 Egypt	67	0
=38 Chile	58	+11
=38 Mexico	58	0
=38 Peru	58	+11
41 Taiwan	42	0
=42 Algeria	36	0
=42 Brazil	36	0
=42 India	36	0
=42 Jordan	36	n/a
46 Iran	15	0
47 North Korea	0	0

## 5) RISK ENVIRONMENT

Rank / 47	Score	Δ
=1 Norway	94	+2
=1 Sweden	94	+5
3 Switzerland	88	0
4 Australia	87	0
5 Canada	83	0
6 Finland	82	-2
=7 Germany	81	+3
=7 Netherlands	81	+2
9 Slovenia	77	+1
10 Taiwan	76	-2
11 Japan	75	0
12 Slovakia	74	+4
13 United Kingdom	73	+5
=14 Belgium	71	+2
=14 United Arab Emirates	71	n/a
=16 Czech Republic	69	+1
=16 South Korea	69	+1
=18 France	66	-6
=18 Hungary	66	0
20 Spain	64	+2
=21 Chile	63	-1
=21 United States	63	+4
23 Poland	61	-4
24 Bulgaria	57	+1
=25 Argentina	55	-3
=25 Romania	55	-1
27 South Africa	53	+4
28 Israel	48	-1
29 Brazil	47	-4
=30 China	44	+4
=30 Morocco	44	-3
32 Jordan	40	n/a
=33 Egypt	39	-5
=33 India	39	+1
=33 Mexico	39	+1
36 Peru	37	-4
=37 Indonesia	36	-5
=37 Kazakhstan	36	+6
39 North Korea	34	+5
40 Uzbekistan	32	+3
41 Algeria	31	-2
=42 Armenia	29	+1
=42 Russia	29	+3
44 Bangladesh	21	-2
45 Iran	18	-1
46 Pakistan	16	0
47 Ukraine	14	-2

# Scores in Key Areas

INSIDER THREAT PREVENTION	
Country	Score
United Kingdom	100
United States	91
Belarus	82
Bulgaria	82
Canada	82
Armenia	73
Australia	73
Czech Republic	73
Finland	73
Germany	73
Hungary	73
Japan	73
Romania	73
Switzerland	73
Taiwan	73
Italy	64
Russia	64
Slovenia	64
Belgium	55
Netherlands	55
Poland	55
Slovakia	55
United Arab Emirates	55
China	45
France	45
South Korea	45
Sweden	45
Ukraine	45
Kazakhstan	36
India	27
Indonesia	27
Israel	27
Pakistan	27
South Africa	27
Spain	27
Argentina	18
Brazil	18
Chile	18
Iran	18
North Korea	18
Norway	18
Peru	18
Uzbekistan	18
Mexico	9
Algeria	0
Bangladesh	0
Egypt	0
Jordan	0
Morocco	0

CYBERSECURITY	
Country	Score
Romania	100
Taiwan	100
Finland	88
Jordan	88
South Korea	88
United Kingdom	88
United States	88
Australia	75
Canada	75
Hungary	75
India	75
Netherlands	75
China	63
Czech Republic	63
France	63
Germany	63
Italy	63
Belarus	50
Belgium	50
Bulgaria	50
Japan	50
Russia	50
Spain	50
Sweden	50
Switzerland	50
Ukraine	50
United Arab Emirates	50
Norway	38
Pakistan	38
Poland	38
Slovakia	38
Slovenia	38
Armenia	25
Kazakhstan	25
South Africa	25
Indonesia	13
Israel	13
Algeria	0
Argentina	0
Bangladesh	0
Brazil	0
Chile	0
Egypt	0
Iran	0
Mexico	0
Morocco	0
North Korea	0
Peru	0
Uzbekistan	0

SECURITY CULTURE	
Country	Score
Finland	100
Ukraine	100
Argentina	75
Australia	75
Canada	75
China	75
Hungary	75
Spain	75
United Arab Emirates	75
United Kingdom	75
Armenia	50
Belgium	50
Bulgaria	50
Czech Republic	50
Germany	50
India	50
Japan	50
Jordan	50
Netherlands	50
Pakistan	50
Japan	50
Romania	50
Russia	50
Slovenia	50
United States	50
Bangladesh	25
Belarus	25
Brazil	25
Chile	25
Egypt	25
France	25
Indonesia	25
Italy	25
Kazakhstan	25
Mexico	25
Norway	25
Peru	25
Poland	25
South Korea	25
Sweden	25
Switzerland	25
Taiwan	25
Uzbekistan	25
Algeria	0
Iran	0
Israel	0
Morocco	0
North Korea	0
Slovakia	0
South Africa	0

TRANSPORT SECURITY	
Country	Score
Australia	100
Belarus	100
Belgium	100
Canada	100
China	100
France	100
Germany	100
Israel	100
Italy	100
Japan	100
Kazakhstan	100
Netherlands	100
Pakistan	100
Russia	100
Switzerland	100
United Kingdom	100
United States	100
Iran	50
North Korea	50
Norway	50
India	0
South Africa	0

# What Countries in Europe Can Do

- Strengthen regulations, particularly in the areas of insider threat prevention, cybersecurity, and security culture
- Continue to support global norms, by providing financial and political support to the IAEA
- Take actions to build confidence in nuclear security, by making regular declarations about civilian nuclear materials and hosting regular IPPAS missions
- Subscribe to nuclear security INFCIRCs

# Radioactive Source Security Assessment



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# Radioactive Source Security Assessment Goals

- Build greater awareness of the importance of radiological security
- Catalyze a dialogue about priorities for strengthening radioactive source security
- Promote progress on radiological security
- Highlight leading practices
- Set a baseline understanding of the status of global radiological security
- Promote reporting, information sharing, and benchmarking

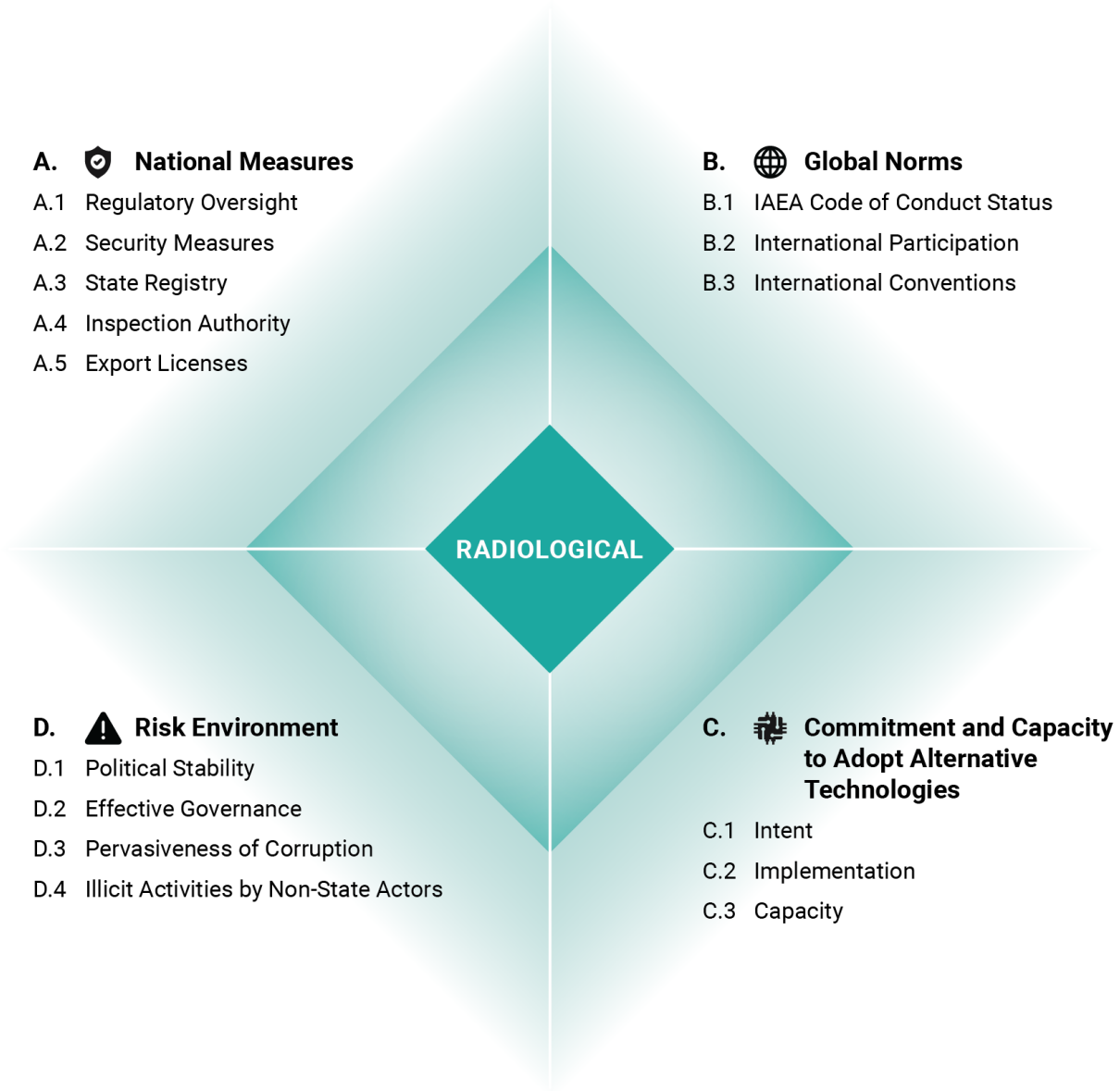


# Assessment Methodology

- 176 countries in this first-of-its-kind assessment
- Assesses actions to prevent a dirty bomb
- Data gathered by the Economist Intelligence Unit
- Research based on existing publicly available databases or other consolidated information, not in-depth review of national laws and regulations
- Does not score or rank countries
- Advised by radiological security experts

# Assessment Framework

## Framework for the Radioactive Source Security Assessment



# Radioactive Source Security Assessment Top Findings

1. The international architecture for radiological security is extremely weak.
2. Most countries do not have adequate regulatory frameworks for regulating and providing oversight of radioactive sources.
  - As a result of these overall weaknesses:
    - There are significant gaps in the ability of countries to track and regulate the movement of radioactive sources, both nationally and transnationally.
    - Cradle-to-grave controls on radioactive sources remain insufficient.
3. Commitments to replace radioactive sources with alternative technologies are limited; and capacity to do so varies.

# Radiological Security: National Measures

- \*Western European & Other Scores
- \*Eastern European Scores

A) NATIONAL MEASURES				
Indicator			No or no data available	Yes
Regulatory Oversight	A.1.1	Does the country maintain a radioactive source regulatory oversight body?	19%	81%
			4%	96%
			0%	100%
Security Measures	A.2.1	Are there regulations that require security measures to be in place to protect radioactive sources?	44%	56%
			24%	76%
			9%	91%
State Registry	A.3.1	Does the state maintain a registry of radioactive sources?	64%	36%
			68%	32%
			26%	74%
Inspection Authority	A.4.1	Does the state have authority to inspect facilities with radioactive sources?	49%	51%
			28%	72%
			17%	83%
Export Licenses	A.5.1	Are there licensing requirements for exporting IAEA Category 1 sources?	55%	45%
			4%	96%
			26%	74%

# Radiological Security: Global Norms

- \*Western European & Other Scores
- \*Eastern European Scores

B) GLOBAL NORMS					No	Yes
Indicator						
IAEA Code of Conduct Status	B.1.1	Has the state made a political commitment and notified the IAEA of their intent to abide by the Code of Conduct on the Safety and Security of Radioactive Sources?			22%	78%
					0%	100%
					0%	100%
	B.1.2	Has the state notified the IAEA of their intent to abide by the Guidance on the Import and Export of Radioactive Sources?			32%	68%
					16%	84%
					9%	91%
	B.1.3	Has the state nominated a Point of Contact to facilitate imports and exports of radioactive source material?			19%	81%
					0%	100%
					0%	100%
	B.1.4	Has the state made available their responses to the IAEA Importing and Exporting States Questionnaire?			40%	60%
					12%	82%
					13%	87%
	B.1.5	Has the state notified the IAEA of their commitment to implement the Guidance on the Management of Disused Radioactive Sources?			79%	21%
					56%	44%
					65%	35%
International Participation	B.2.1	Does the state participate in the Global Initiative to Combat Nuclear Terrorism (GICNT)?			51%	49%
					0%	100%
					4%	96%
	B.2.2	Has the state sent an official delegation to the 2018 International Conference on the Security of Radioactive Material?			59%	41%
					48%	52%
					30%	70%
International Conventions	B.3.1	Is the country a state party to the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT)?			39%	61%
					16%	84%
					13%	87%
	B.3.2	Is the country a state party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management?			54%	46%
					12%	88%
					4%	96%
	B.3.3	Is the country a state party to the Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency?			40%	60%
					8%	92%
					17%	83%

# Radiological Security: Alternative Technology

- \*Western European & Other Scores
- \*Eastern European Scores

C) COMMITMENT AND CAPACITY TO ADOPT ALTERNATIVE TECHNOLOGIES							
Indicator			No	Yes			
Intent	C.1.1	Has the state subscribed to INFCIRC/910?	82%	18%			
			32%	68%			
			74%	26%			
			No or no data available	Yes			
Implementation	C.2.1	Has the country publicly declared a regulatory requirement, policy, or commitment to implementing alternative technology to replace high-activity radioactive sources?	94%	6%			
			68%	32%			
			87%	13%			
			No data available	Frequent power outages (80-99th percentile)	60th-79th percentile	40th-59th percentile	20th-39th percentile
Capacity	C.3.1	What is the average percentage of businesses experiencing power outages each month?	26%	15%	15%	15%	14%
			88%	0%	0%	4%	4%
			0%	0%	4%	9%	35%
			No data available	Few people with degrees (0-19th percentile)	20th-39th percentile	40th-59th percentile	60th-79th percentile
	C.3.2	What percentage of the population over 25 holds a tertiary degree or higher?	39%	13%	12%	13%	12%
			0%	0%	0%	4%	20%
			26%	4%	13%	26%	26%
							Many people with degrees (80-99th percentile)
							15%
							4%
							52%
							76%
							4%

# What Countries in Europe Can Do

- Strengthen radiological security regulations for securing, controlling, and tracking radioactive sources, including exports
- Strengthen regulatory oversight and inspections
- Make a political commitment to the IAEA Code of Conduct on the Safety and Security of Radioactive Sources Supplemental Guidance on the Management of Disused Sources
- Subscribe to INFCIRC/910
- Commit to implementing alternative technology for the most dangerous sources, where possible
- Engage in international efforts to strengthen national capacity to implement alternative technology

# Q&A

