

# Perigos Nucleares

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**O Mediterrâneo, O Norte de África e a Ameaça Nuclear**

Instituto de Estudos Superiores Militares 18.11.2008

Textos relacionados encontram-se disponíveis  
em

<http://jddomingos.ist.utl.pt>

## Realidades Fundamentais

Os átomos não sabem se são civis se militares ...

**Energia Nuclear para fins civis e  
Energia Nuclear para fins militares  
são indissociáveis**

## Centrais Nucleares

Region	Nuclear Capacity [GW]			Share of nuclear in electricity generation		
	2005	2030 Reference Scenario	2030 Alternative Policy	2005	2030 Reference Scenario	2030 Alternative Policy
<b>OECD</b>	<b>308</b>	<b>296</b>	<b>362</b>	<b>22%</b>	<b>16%</b>	<b>22%</b>
OECD North America	112	128	144	18%	15%	18%
OECD Europe	131	74	110	28%	12%	20%
OECD Pacific	65	94	108	25%	32%	41%
<b>Transition economies</b>	<b>40</b>	<b>54</b>	<b>64</b>	<b>17%</b>	<b>18%</b>	<b>23%</b>
<b>Developing countries</b>	<b>19</b>	<b>66</b>	<b>93</b>	<b>2%</b>	<b>3%</b>	<b>5%</b>
China	6	31	50	2%	3%	6%
India	3	19	25	2%	6%	9%
Other Asia	5	10	10	4%	3%	4%
Latin America	3	4	6	2%	2%	3%
Middle East and Africa	2	3	3	1%	1%	1%
<b>World</b>	<b>368</b>	<b>416</b>	<b>519</b>	<b>15%</b>	<b>10%</b>	<b>14%</b>

Table 7.2. International Energy Agency (IEA) nuclear capacity projections for 2030.<sup>313</sup>

## Centrais Nucleares e Rede Eléctrica-1

- Para ser economicamente viável tem de ter uma potencia superior a 1500 MW
- Para se poder inserir na rede eléctrica não pode representar mais do que ~20% da potencia instalada e ser inferior à potencia mínima em consumo permanente...

## Centrais Nucleares e Rede Eléctrica-2

- Exige interligação com capacidade para a substituir nas paragens programadas e imprevistas...

### Conclusão:

**Não há racionalidade económica que justifique Centrais Nucleares no Norte de África para produção de electricidade**

## Dados Base

Uma Central Nuclear de 1500 Me produz  
diariamente ~ 6 kg de plutónio (239,240 ...)

A massa crítica depende da densidade, forma  
geométrica e tipo de material.

Para uma geometria esférica a massa crítica do  
plutónio-239 varia entre 5 e 8Kg consoante  
está ou não rodeada de material reflector (p.ex  
U238)

1kg Plutónio-239 ~ 20 kt TNT (Nagasaki)

**NUCLEAR WEAPONS AND DETERRENCE IN THE 21ST CENTURY**  
**SECRETARY ROBERT GATES, U.S. DEPARTMENT OF DEFENSE, 28.10.2008**  
[http://carnegieendowment.org/files/1028\\_transcrip\\_gates\\_checked.pdf](http://carnegieendowment.org/files/1028_transcrip_gates_checked.pdf)

“What worries me are the tens of thousands of old  
nuclear mines, nuclear artillery shells and so on,  
because the reality is the Russians themselves  
probably don't have any idea how many of those  
they have or, potentially, where they are”

**Gregory Schulte, U.S. ambassador to the International Atomic Energy Agency**, at the opening of the one-day meeting organized by the 56-state Organization for Security and Cooperation in Europe (OSCE) . Viena 8.11.2006, Associated Press

“ Terrorist use of weapons of mass destruction is one of the gravest threats today to the world community (...) The threat is real, the consequences would be enormous.(...) We have to assume that terrorist groups will continue to try and acquire the sensitive materials they need to produce weapons of mass destruction (...) Any dedicated group with some knowledge of science and engineering and access to the Internet and some funding can construct such a device(...) The U.N. nuclear watchdog confirmed 18 incidents between 1993 and 2004 of trafficking of plutonium or highly enriched uranium in the OSCE area”.

## Atualização-IAEA-2007

- The U.N. nuclear Illicit Trafficking Database contains 1,266 incidents that have been reported by 99 nations over the last 12 years.
- Between 2002 and 2006, the last year for which records have been compiled, reports of trafficking events increased by 385 percent

Fonte: Richard Hoskins, section head in the IAEA Nuclear Safety and Security Department.

Former defense Secretary William Perry “Testimony, House Armed Services Committee Strategic Forces subcommittee” July 18, 2007

“Terrorists would not use a ballistic missile to deliver their bomb; they would use a truck or a freighter.

The mode of operation could be like the delivery of the truck bomb in Oklahoma City, but with the truck carrying a nuclear bomb instead of a few tons of explosives.

So it seems all too clear that we can not deal with the danger of nuclear terrorism by missile defense. Similarly, deterrence is not likely to be effective against a terror organization like Al Qaeda”.

Former defense Secretary William Perry “Testimony, House Armed Services Committee Strategic Forces subcommittee” July 18, 2007

**A “socalled” tactical bomb could be put in a suitcase.**

**The plutonium need to make a bomb as destructive as the Hiroshima bomb is about the size of a grapefruit.**

**There is no interdiction system that exists or that is conceivable that would have a good probability of stopping a clever smuggler from transferring either of these.**

# Plutónio

- Reportedly, 270-300 kg of plutonium are transported per shipment from La Hague to Marcoule for fuel fabrication.
- 56 MOX-fueled reactors need between 400–500 kg of plutonium per year, which may be delivered in one or two shipments. **Thus shipments of a few hundred kilograms of plutonium—enough to make 30-60 Nagasaki bombs—are on the roads during an average week in France and Germany.**

International Panel on Fissile Materials, *Global fissile material report 2007*.  
Online at [www.fissilematerials.org](http://www.fissilematerials.org).

## Rotas de plutónio na Europa

International Panel on Fissile Materials, *Global fissile material report 2007*.



**Figure 1.6. Sites and transport-routes of separated plutonium in Europe.** Separated plutonium oxide is shipped regularly from the French reprocessing facilities for fuel-fabrication at Marcoule and from there to reactor sites in France, Germany, and

elsewhere. Right: In October 2004, Greenpeace activists were able to intercept a truck carrying 140 kilograms of U.S. weapon-grade plutonium across France at a public gas station.<sup>54</sup> [Photo courtesy of Greenpeace/Clements]

## FRANÇA

“Although President Nicolas Sarkozy declared in March 2008 that he had “decided that France could and should be more transparent with respect to its nuclear arsenal than anyone ever has been,” France remains the only European nuclear weapons state that has not yet declared whether its aircraft carrier still carries nuclear weapons under normal circumstances”.

<http://www.fas.org/blog/ssp/2008/09/france.php>



Sarkozy says he wants to be more open about France's nuclear arsenal "than anyone ever has been" about theirs. OK, does the aircraft carrier Charles de Gaulle still carry nuclear weapons in peacetime?

## Politica Francesa

A França irá fornecer uma Central Nuclear à Líbia e fez iguais ofertas a outros países do Mediterrâneo

A França juntou-se aos EUA na violação do Tratado de Não Proliferação Nuclear com o fornecimento à Índia de materiais e know-how sensíveis (é de origem francesa o reactor nuclear que permitiu à Índia fabricar a sua 1ª bomba nuclear, usando plutónio. )

A Índia, tal como o Paquistão, não subscreveu o Tratado de Não Proliferação.

## A grande incógnita

Vamos assistir à nuclearização  
do Mediterrâneo  
sob  
hegemonia francesa ?