

## Is the Sky Falling? Energy Security and Transnational Terrorism

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### Introduction

This paper will assess the extent to which transnational terrorists, in particular global Jihadists associated with Osama bin Laden, have been interested in attacks against the global energy infrastructure.<sup>[1]</sup> We then assess the extent to which terrorists have in fact targeted that infrastructure and with what effect. We then place these attacks in the context of other supply disruption events. Finally, we make suggestions about a viable way ahead.

Western fears about the threat posed by transnational terrorists to energy supplies certainly seem warranted. al-Qaeda has repeatedly threatened to disrupt supplies and have followed up on those threats in a few cases. For example, following the attack on the French tanker *Limburg* in October 2002, al-Qaeda issued a statement that it "was not an incidental strike at a passing tanker but...on the international oil-carrying line in the full sense of the word."<sup>[2]</sup>

Moreover, al-Qaeda sees the U.S. intervention in Iraq as strongly linked to the supply of oil. A Bin Laden audio tape broadcasted December 19, 2004 proclaimed:

Targeting America in Iraq in terms of economy and losses in life is a golden and unique opportunity. ... One of the most important reasons that led our enemies to control our land is the theft of our oil....Be active and prevent them from reaching the oil, and mount your operations accordingly, particularly in Iraq and the Gulf, for this is their fate.<sup>[3]</sup>

Several Jihadi theorists and commentaries on their ideas have also highlighted the importance of striking oil targets. For example, a Jordanian journalist, Fouad Hussein, claims that energy attacks play a major role al-Qaeda strategy based on his interviews with their leadership. He sees them pursuing a multistage approach to eventual establishment of an Islamic caliphate by 2020. The first stage leads to the awakening of Muslim masses through such actions as the attack on the World Trade Center in 2001. In the second phase, from 2003-2007, called the "Eye Opening," al-Qaeda "deprives the West of energy [and] denies 'proxy regimes' oil revenue."

In the third phase al-Qaeda recruits enough individuals to be able to confront Israel directly so that in the fourth phase from 2010 to 2013, "Economic warfare will be waged against the United States and the West more broadly—including burning "Arab oil" and conducting electronic attacks against critical infrastructures." By 2020, al-Qaeda achieves victory.

Other al-Qaeda strategists argue attacks against oil and gas infrastructure are attractive not so much because of their intrinsic value but because of the cost of defending them.<sup>[4]</sup> Osama bin

Laden himself has advocated this bleed to bankruptcy policy and cited it as one of the reasons for the success against the Soviets in Afghanistan.

Many experts take these warnings to heart and proclaim the vulnerability of global energy supply. For example, Robert Baer, writing about the concentration of assets in the Saudi Arabia in his book titled *"Sleeping with the Devil: How Washington Sold Our Soul for Saudi Crude"* claimed: "a moderate-to-severe attack on Abqaiq would slow average production there from 6.8 million barrels a day to roughly a million barrels for the first two months post-attack."

## Terrorists Targeting

The RAND Corporation posits four types of hypotheses regarding al-Qaeda.<sup>[5]</sup> The first is a coercion hypothesis which posits that al-Qaeda will attempt to coerce the United States to leave the Muslim world. The second is the damage hypothesis where al-Qaeda tries to limit the U.S. ability to intervene in the Muslim world. The third is the rally hypothesis whereby al-Qaeda seeks to recruit like-minded individuals to resist U.S. efforts. And fourth is the franchise thesis whereby al-Qaeda, lacking resources, serves as a clearing house for other loosely affiliated organizations. For our purposes we are most concerned with the damage hypothesis which covers economic targets generally.

RAND looked at 14 targets from the 1993 attack on the World Trade Center to the 2004 bombing of the Hilton Taba Resort in South Sinai, Egypt. Many of these targets fit several of the hypotheses. For example, 9/11 fits the coercion, damage and rally hypotheses. Many targets met several objectives. Nevertheless, al-Qaeda has shown a decided preference for coercion in 13 out of the 14 cases. Much less support appears for the franchise (7 of 14) and rally hypotheses (5 of 14). Least support comes for the damage hypothesis (4 of 14) and only one of these is an energy target, the attack on the French tanker Limburg in 2002. Interestingly some analysis suggests that the terrorists attacked the Limburg only because their preferred target, a U.S. military vessel, did not present itself.<sup>[6]</sup>

Examining all the international terrorist incidents between 1999 and 2006 reveals very little interest in energy targets, as can be seen in Figure One. Of the almost 2000 international terrorist incidents only 23 or about 1 percent involved utilities, the surrogate in the Memorial Institute for the Prevention of Terrorism data base for energy targets.<sup>[7]</sup> Many of these international incidents are little different from domestic targets except they involve foreigners instead of locals. Nothing comparable to the Limburg incident exists in the MIPT data base.

Terrorist incidents overall have increased dramatically since 1999 (see Figure Two). From 1999 to 2001, terrorist incidents overall remained at 1000. After 2001 they steadily increased reaching 6500 incidents by 2006. International incidents, those involving foreigners, did not increase at the same rate or follow the same pattern. For 1999 and 2000, incidents were around 100, jumping to 200 in 2001 and 300 in 2002. The number receded a bit in 2003 to 277 but jumped to 395 in 2004 and fell off to 311 and 241 in 2005 and 2006 respectively. Many of these incidents are "drive-bys," foreigners who were caught up in an ongoing insurgency. Very few are spectacular incidents such as those cited by the RAND study.

According to MIPT, the global al-Qaeda organization has conducted 25 attacks since 9/11, none of them similar to the Limburg. Other attacks on oil infrastructure include a failed attempt on an Iraqi oil terminal in 2004 and a failed suicide bombing of the Abqaiq facility in Saudi Arabia on 24 February 2006. The terrorists were unable to penetrate the compound. The Saudis also arrested individuals in 2006 and 2007 that purportedly were planning attacks against oil facilities.<sup>[8]</sup>

The dramatic increase in the number of terrorist incidents reflects the increasing use of terrorism in ongoing insurgencies particularly in places like Iraq and Afghanistan. Figure Three shows that

the insurgency in Iraq accounts for an increasing percentage of terrorist incidents, accounting for roughly 60 percent of total incidents in 2006.

Attacks on energy infrastructure follow the same pattern as the overall increase in terrorist incidents as can be seen in Figure Four. From 1999 to 2001, attacks on infrastructure remained below 50, doubled to 100 in 2002 and fell back to below 50 in 2002. Since then attacks have steadily increased, almost doubling each year.

A detailed examination of the infrastructure attacks is given in Figure Five. The distribution of attacks suggests that insurgents can have differing objectives in their attacks on energy infrastructure. al-Qaeda in Iraq is widely considered to be particularly violent with little concern for killing civilians. They believe in intimidation through violence. Thus over half of attacks in Iraq are against employees. Moreover, terrorists in Iraq like to target tanker trucks, the explosion of which can produce substantial damage. A favored target for insurgents everywhere are pipelines which run above ground. Transmission lines and their pylons are also attractive. Baluchi insurgents in Pakistan are particularly fond of attacking the Loti gas plant in Dera Bugti in part because they resent what they see as the exploitation of their resources without compensation.<sup>[9]</sup> "It is a great injustice," said a goat herder from Dera Bugti, Foj Ali. "They are making billions of rupees pumping gas from our land to the rest of the country, and we are still using firewood."<sup>[10]</sup>

In a recent report, the Government Accounting Office lists several reputed "recent high-profile terrorism incidents against tankers and energy infrastructure."<sup>[11]</sup> This list includes the attacks mentioned already, but adds the assault on the Shell oil facility in Nigeria in June 2006, the hijacking of the Penrider in 2003 and a pirate attack on the chemical tanker Dewi Madrim in 2003, the last of which is arguably not a terrorist incident at all. Only six incidents made this list and none of them had significant consequences. Small wonder that the Limburg case remains the one most commonly cited as an example of al-Qaeda intentions.

Piracy continues to be a problem, but it is economically not politically motivated. After the incidents in 2003-4, littoral states to the Malacca Strait stepped up their patrols. Incidents dropped from 28 in 2003 and 38 in 2004 to 12 in 2005, 11 in 2006 and 7 in 2007.<sup>[12]</sup> Overall, there were 445 incidents of piracy in 2003, 329 in 2004, 276 in 2005, 239 in 2006 and 263 in 2007. Particularly noteworthy is the spike of 42 incidents in Nigeria in 2007. The vast majority of successful attacks, 127 out of 187, have occurred with the ship was berthed or anchored. The vast majority of unsuccessful attacks, 58 out of 76, occurred when the ship was steaming. Pirate attacks on tankers are actually quite common. In 2007, 52 chemical tankers were attacked, 25 crude oil tankers, 5 LPG tankers, 1 Bitumen tanker and 1 LNG tanker. Clearly pirates are interested in tankers even if terrorists seem not to be. For example, on 22 September 2007, pirates boarded and hijacked the Indonesian Product Tanker MT Kraton which carried a cargo of Palm Olein. Two days later the Indonesian located the tanker, boarded it and detained the 14 pirates. Also noteworthy is that in many of the incidents in Nigeria, the local coast guard and police failed to respond to calls for help.

In sum, spectacular attacks against the global energy infrastructure are rare and the only successful such attack occurred in 2000. On the other hand, attacks against the energy infrastructure have become routine in at least three ongoing insurgencies, Colombia, Iraq and Pakistan. Most of these attacks had only a minor effect. How do these attacks and attendant disruptions compare with other events affecting supply?

## Significant Events Affecting Oil Supply

The Energy Information Agency tracks the significant events affecting global supply of oil and gas; from 1970 to 2006<sup>[13]</sup> only three events related to terrorism or ethnic conflict were considered large enough in their effect to be listed: 62, the attacks on the World Trade Center and the

Pentagon on 9/11/2001; 70, continuing oil supply disruptions in Iraq and Nigeria in 2005; and 73, militant attacks in Nigeria which decreased production by as much as 600,000 barrels per day (bpd). The attack on the French tanker Limburg was not viewed as being significant enough to affect prices. Moreover, 9/11 actually led to a decline in prices as global markets feared an economic slowdown in the United States. The February 2006 violence in Nigeria was followed by a short spike in the price of oil which then fell back sharply to \$50. It is estimated that 15 percent of Nigeria's production capacity of 3.1 million bpd remains unavailable because of the ongoing violence.[14]

One reason that the Nigerian violence did not have a more lasting effect may have been that there was sufficient spare capacity in oil at that time and production could be increased to meet the shortfall. Currently, OPEC alone, or perhaps more precisely Saudi Arabia, has sufficient capacity to handle some shortfalls. However spare capacity is a real issue. It had fallen to 1.25 million bpd in 2007 but is scheduled to increase to 3.1 million bpd during 2008.[15]

Natural events rather than terrorism have had a much more pronounced effect on the oil market. Tropical Storm Cindy and Hurricanes Dennis, Katrina, and Rita so disrupted the market that the United States sold 11 million barrels of oil from the Strategic Petroleum Reserve and lent almost 10 million. Hurricanes Rita and Katrina shut down about 1.3 million barrels of refining capacity, about 8 percent of the U.S. national total.[16] Much of the shortfall was met by imports.

Political events not associated with terrorist attacks also effect supply. For example, a general strike in Venezuela in 2002 led to a temporary loss of as much as 1.5 million bpd to the United States.[17] War fears also periodically trouble the market.

The attack on the Limburg, which did not affect the market, is perhaps most analogous to an oil spill. Depending on the account, the Limburg lost between 50,000 and 90,000 barrels of oil. Although it is difficult to get annual information for all types of spills, a detailed report is available for 1999.[18] In that year, 760,000 barrels of oil spilled in 257 incidents (of at least 240 barrels). Of these 11 involved tankers with a total loss of about 157,000 barrels. Most of the spills involved pipelines. However the largest spills were associated with tankers. Of the 66 largest spills, 48 involved tankers.

The International Owner Tanker Pollution Federation Limited (IOTPFLL) keeps an annual database of spills. Since 2000, there have been only 3-5 large spills associated with tankers a year.[19] The decline in spills after 1990 can be attributed in part to the Oil Pollution Act of 1990 that required all tankers built after 1994 that come to the United States to have double hulls. In light of the IOTPFLL data, we can see that the Limburg case, by itself, does not pose a unique problem and falls well within the parameters of normal "accidental" spillage. Therefore it is not surprising that it had no apparent effect on the oil market.

Attacks on pipelines also cause spills. But here too they would seem to fall within the parameters of normal wear and tear. The Russians had 22,000 pipeline bursts in 2005 and suffer at least 10 serious leaks a year.[20] In 2006, one pipeline had a 2000 barrel spill.

Many of the pipelines in places like Iraq and Pakistan are vulnerable and easily attacked. They are also old and susceptible to leaking in any case. One commentator has even called pipeline sabotage the terrorist's weapon of choice.[21] Attacks on the pipeline system are seen as a major reason that Iraq will not reach its full potential as an exporter.[22]

## **Aligning Targets, Insurgents, Terrorists, and Energy Infrastructure**

As many commentators have noted, the insurgents and oil tend to be in the same places or at least within easy striking distance. Moreover, some studies suggest that an over-reliance on

primary commodities increase the likelihood of civil war. For example, series of studies conducted at the World Bank suggests that the primary motivation for rebel activity is the opportunity provided by the exploitation of primary commodities in their country.<sup>[23]</sup> Although Collier and Hoeffler were thinking of commodities like diamonds, timber, coffee and coca, oil plays a big role in the economic indicator they used to measure economic dependence on primary commodities. This reliance on a primary commodity in a poor country with limited prospects for growth forms a witches' brew for internal political violence. Although other studies have not found as strong an effect as Collier and Hoeffler, there are certainly several case studies that illustrate their point, including Sudan and Nigeria.<sup>[24]</sup>

Indeed, it is interesting to note that many of the places listed by the U.S. Energy Information Agency as "energy hot spots" suffer from an excessive reliance on oil as a major source of national income.<sup>[25]</sup> All of these countries and regions are highly dependent on energy exports and suffer from local or nearby political instability. Instability in Nigeria and Iraq has substantially decreased global energy supplies.

Russia poses a different problem as it uses its position for political gain. The oil and gas sector makes up 20 percent of the Russian economy accounts for over 60 percent of the country's export revenues the dramatic increase in the price of energy has been a major reason for Russia's increasing assertiveness in the world arena.

Instability in Venezuela has affected the market in two ways. Hugo Chavez has threatened to cut off oil supplies to the United States several times, most recently after Exxon Mobil secured court orders in the United States, the Netherlands and the United Kingdom to freeze Venezuelan assets. Exxon Mobil is seeking compensation for facilities seized by Venezuela. Chavez has never made good on his threats in part because there are few refineries that can handle Venezuela's heavy sour crude.<sup>[26]</sup> Moreover, Venezuela suffers from internal instability as large segments of Venezuela society oppose Chavez. In 2002, a devastating strike shut down Venezuelan oil industry as opponents hoped to oust Chavez. At least two tankers joined the strike.

It is often the case that once a civil war or sectarian violence starts, the local energy infrastructure becomes a target. This is clearly the case in Iraq and Colombia. Furthermore, in Pakistan the Baluchis believe the governing Punjabis are exploiting their resources so the Baluchis attack the pipelines that take the natural gas to Punjab.

## Flows and Ungoverned Territories

Not only does political instability characterize many oil exporting states, many major choke points are situated in or nearby such areas. The U.S. Energy Information Agency has identified the major flows of oil and choke points, including the Russian system of pipelines and export terminals because it is near capacity (see [Table Two](#)). Malacca has become increasingly important because of growing Chinese energy demand.

The RAND Corporation has recently done a study looking at the relationship between ungoverned territories and prospects for terrorism.<sup>[27]</sup> [Table Three](#) gives a list of ungoverned territories and their proximity to energy sources or flows. The only area distant from energy sources or flows is the Pakistani-Afghan border region, reputed location of Osama bin Laden and his lieutenants.

The RAND study selected these areas based on two important aspects: ungovernability and conduciveness to terrorist or insurgent presence. Ungovernability means that the state has abdicated or is unable to perform its responsibilities in particular areas that ordinarily would fall under its control. RAND looks at four main variables to determine ungovernability: "(1) the level of state penetration of society; (2) the extent to which the State has a monopoly on the use of force;

(3) the extent to which the state controls its borders; and (4) whether the state is subject to external intervention by other states." [28] Conduciveness is also a function of four variables: "(1) adequacy of infrastructure and operational access, (2) availability of sources of income, (3) favorable demographics, and (4) invisibility." [29]

**Table Two: World Oil Transit Chokepoints**

<b>Choke Point</b>	<b>Traffic</b> (millions bpd 2006)	<b>Past disturbances</b>
Strait of Hormuz	16.5-17.0	Sea mines during Iran-Iraq War; terrorist threats after 9/11
Malacca	15	Pirates including terrorist threat in 2003; poor visibility from smoke haze
Suez Canal/Sumed pipeline	3.8	Closed for eight years after 1967 war; Two tankers run aground 2007
Bab el-Mandab	3.2	USS Cole attacked 2000; Limburg attacked 2002
Bosporus	3.0	Numerous shipping accidents
Panama Canal	0.4	
Russia Pipelines/Terminals	Druzhba (1.2 million bpd); Baltic Pipeline	
System (840,000 bbl/d)		

Source: [http://www.eia.doe.gov/cabs/World\\_Oil\\_Transit\\_Chokepoints/Background.html](http://www.eia.doe.gov/cabs/World_Oil_Transit_Chokepoints/Background.html) accessed March 2, 2008.

**Table Three: RAND list of ungoverned territories next to both oil producing areas and flows**

<b>Ungoverned Territory</b>	<b>Proximity to Energy Sources or Flows</b>
The Pakistani-Afghan Border Region	None—source of global jihad
The Arabian Peninsula	Saudi Arabia; Hormuz, Horn of Africa
The Sulawesi-Mindanao Arc	Malacca
The East Africa Corridor	Horn of Africa; Sudan; Bab el-Mandab
West Africa	Gulf of Guinea; Nigeria
The North Caucasus	Russian pipelines; BTC
The Colombia-Venezuela Border	Colombia; Venezuela
The Guatemala-Chiapas Border	Mexico

Source: Angel Rabasa, et al., *Ungoverned Territories: Understanding and Reducing Terrorism Risks*. MG-561, 2007

Important for our analysis is the presence of armed organized groups next to critically important choke points—in particular Hormuz and Bab el-Mandab. All of these areas are characterized by a lack of border controls—which means that, in effect, until such time as the state itself gains sufficient capacity, outsiders will have to ensure that these groups will not operate outside their areas.

RAND also found that favorable demographics were a key factor in determining conduciveness to terrorism. Particularly important is the existence of supportive social norms that allow social and cultural resistance. RAND thinks that this is less true for the Straits of Hormuz and the Bab el-Mandab (the Horn of Africa) but truer of Mindanao, which is some distance from the Strait of



Malacca. In sum RAND thinks that the central government has not really tried to assert control over areas around near the Straits of Hormuz and the Bab el-Mandab. In contrast, the central government has met resistance in Mindanao.

Despite the proximity and opportunity of energy flows and sources to rather large nests of terrorists, surprisingly the infrastructure is infrequently attacked. Reasons vary. First and most obviously, the insurgents seem to be fully preoccupied in their local attacks on governments. Second, the kind of attacks must often cited by pundits require a level of skill and planning and logistics support beyond the capacity of most global Jihadists. Given a choice between a relatively soft and insecure target such as a pipeline and the relatively hard and protected Saudi oil facilities, the Jihadists will choose the soft target. Finally, the U.S. government and others have been quite active in thwarting these attacks, most especially in the area of maritime security.

## Conclusions and Observations

Fear mongering analogous to what has occurred on the WMD threat posed by transnational terrorists has affected the consideration of the threat posed to energy security by the same group. Despite the tens of thousands of terrorist incidents since 9/11 and thousands of piracy events there has been only one major successful attack on the global energy infrastructure, the French tanker Limburg in 2002. This seems remarkable given the prominence attacks on energy infrastructure have play in the views of certain al-Qaeda theorists. The partial answer to this comes from RAND—al-Qaeda, despite its rhetoric, is not seriously going after economic targets.

Even though we have managed to establish that transnational terrorists have not made economic targets a serious priority, there a number of things that should be done and some in fact are being done already in deterring the possibility of future attacks. First, and most obviously, increasing spare capacity should have priority. This is not so much in reaction to the threat posed by transnational terrorists to energy security but because of the increasing fragility of the energy supply system to disruption of any kind, natural or man-made. The East African corridor, especially in the Horn of Africa, and the Arabian Peninsula should have priority for weight of effort both in the near and far term. These areas are near both energy sources and transit choke points -- especially Hormuz and the Bab el-Mandab.

RAND makes several recommendations about how to proceed with these areas. The major problem is how "to increase the capacity of the states to extend their reach into these spaces and thereby reduce their availability to terrorist networks."[\[30\]](#) For the Arabian Peninsula, there are a large number of programs already underway. However, no country in this area yet participates in the U.S. Terrorism Interdiction Program. RAND also recommends that the local police and interior ministry forces in the area receive more training, especially in the area of border security.

The U.S. government approach to the Horn of Africa has been much more direct. The United States has a major military presence in Djibouti with the Combined Joint Task Force—Horn of Africa (CJTF-HOA).[\[31\]](#) This JTF has an extensive ongoing civic engagement program in the region. Another U.S. initiative is the Global Peace Operations Initiative that was announced at the G8 summit in 2004. This program was intended to increase the capacity of the local militaries to conduct peacekeeping.[\[32\]](#) Moreover, the United Kingdom has a counterterrorism program intended to showcase Kenya as a means to develop a more comprehensive counterterrorism strategy.[\[33\]](#)

The comments that RAND makes for the Horn of Africa also apply for the Arabian Peninsula:

The overall aim should be to build sustained national resilience that is intolerant of, and effective against, terrorist and associated extremist designs. This can only occur if hard security initiatives are linked with a broader array of policies designed to promote political, social, and economic

stability. Without such a two-track approach, there is little chance that counterterrorist modalities will take root or provide the basis for the effective mitigation of threats to peace and normalcy.[\[34\]](#)

An "ungoverned territory" does not immediately abut the Strait of Malacca, especially since the Aceh insurgency in Indonesia. The Sulawesi-Mindanao arc is at some distance from the Strait. Nevertheless, pirates continue to be active in the Strait of Malacca and hijacked a gas tanker in 2005.[\[35\]](#) After this episode, the littoral states increased the number and duration of their patrols and incidents fell off.[\[36\]](#) Although Singapore among littoral states is amenable to foreign assistance, Malaysia and Indonesia are not, in contrast to the situation on the Arabian Peninsula littoral.

Malaysia's Prime Minister Abdullah rejects the U.S. proposal for an international force to patrol the Malacca Strait. At a recent international conference he said, "We are strongly against any involvement of foreign assets to ensure security of the strait."[\[37\]](#)

Several combined task forces operate in and around the Arabian Peninsula littoral; all of them intended in part to deal with the problem of transnational terrorism. Two Combined Task Forces cove the Arabian (Persian) Gulf and the other the Horn of Africa. CTF-150 is a multinational task force that operates from Djibouti. It conducts maritime security operations in the Gulf of Aden, Gulf of Oman, the Arabian Sea, Red Sea and the Indian Ocean. The task force at various times has been commanded by a French, Dutch, German, British and Pakistan officers, whose navies make up the ships. According to Vice Adm. David C. Nichols Jr., Combined Maritime Forces Component (CFMCC) commander, "The mission, fundamentally, is to prevent terrorists from using the sea as a venue for terrorist attacks or an enabler for terrorist attacks ashore."[\[38\]](#)

Combined Task Force 58 is in the northern Persian Gulf and protects oil terminals. Combined Task Force 152 patrols the middle and southern Persian Gulf. CTF 58 consists of forces from Australia, the United Kingdom, the United States and Iraq. British and Australian officers have led the task force. Only American ships are involved in CTF 152. These forces have thwarted terrorist attacks. On April 24, 2004, terrorist used three dhows loaded with explosives to attack the Iraqi oil terminal near the Iraqi port of Umm Qasr. They failed, blowing themselves up as coalition forces moved to intercept them.[\[39\]](#)

Nothing comparable to the CTFs around the Arabian Peninsula exists in the Strait of Malacca. The United States does have an annual exercise with littoral states conducted under the auspices of Cooperation Afloat Readiness and Training (CARAT).[\[40\]](#)

As we have seen above, maritime security is good and getting better in part because early problems with tankers, having nothing to do with terrorists, have been addressed.

The Government Accounting Office has recently released a report looking at threat to tankers.[\[41\]](#) They assessed that tankers faced three main types of threats—suicide bombings, standoff attacks and armed assaults. The GAO found that much was being done to meet the challenges internationally but some problems exist in implementation of a number of agreements.

Pipeline security can be improved significantly just as it was with the BTC pipeline, although many of the measures taken would primarily be appropriate for building new pipelines. A number of significant security measures were taken, among them, burying the pipeline along almost its entire route and hardening the pipeline against corrosion. Above ground structures have extensive security measures, including concrete blast walls, security cameras and specially trained gendarmerie.[\[42\]](#) British Petroleum has signed a bilateral agreement with the Georgian government for additional security measures.



A recent study has recommended the BTC approach for new pipelines in Iraq.[43] It concludes "significant improvements in export capacity are possible despite an ongoing insurgent campaign to hinder the flow of oil." Both infrastructure expansion and defensive measures such as burying pipelines and hardening above-ground facilities can significantly mitigate the effects of terrorist attacks.

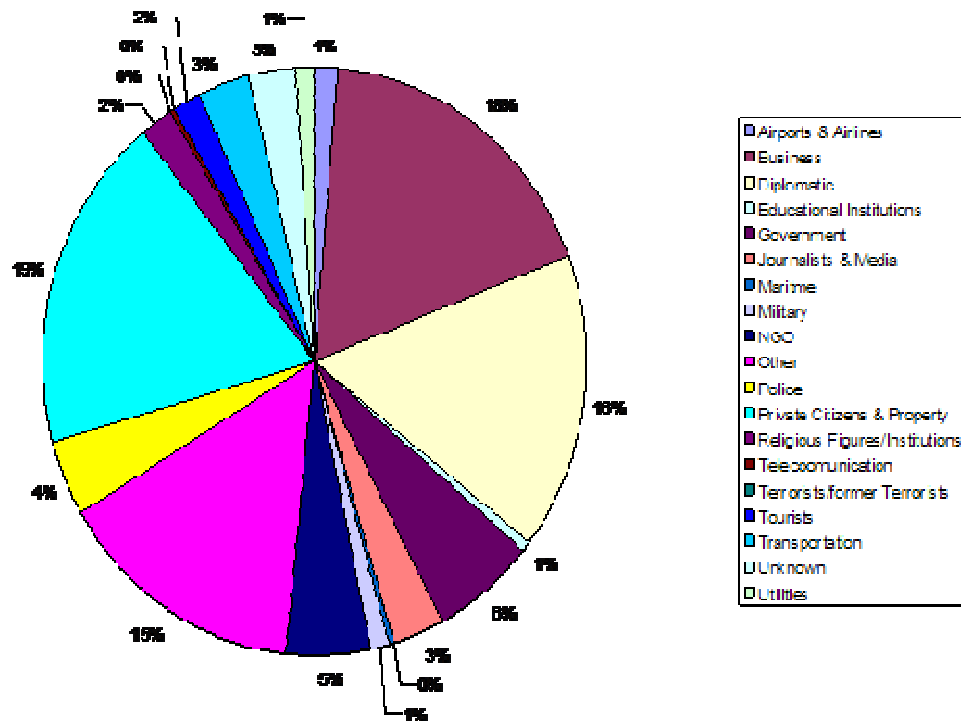
In summary, the threat from and effect of transnational terrorism is much less than many pundits have argued. In essence, the transnational terrorism poses a challenge well within the parameters of natural events and the ability of the current security system to handle. We see no reason to dispute Robert Larsson's main point; the problem is more one of short-term shortage of supply and spare capacity:

Well, we must remember that the prime threat to the security of supply in the short-term perspective is not terrorism, or even politics. It's Mother Nature. That's the biggest problem—*shortage of supply*. But most of our political attention is directed toward the threat of terrorism. But terrorism is only a minor problem in the short-term perspective. It's easier to cope with that than to cope with political unreliability or a deficit in gas.[44]

Moreover, with respect to maritime terrorism, RAND has concluded, "Many perceptions of maritime terrorism risks do not align with the reality of threats and vulnerabilities." [45] The sky is definitely not falling.

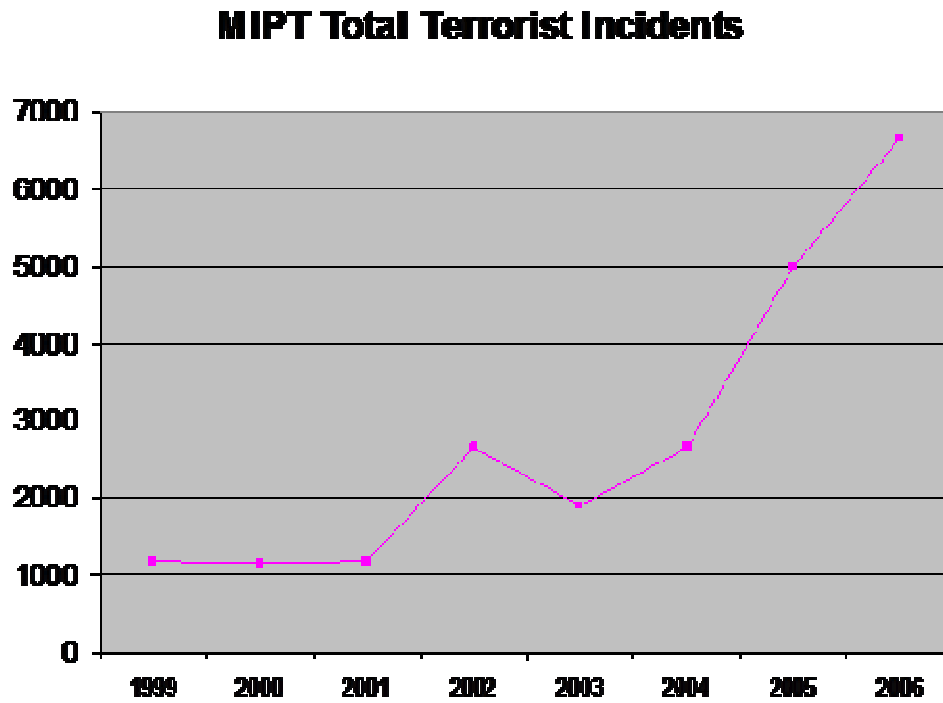
## Figures

Figure 1: Distribution of International Terrorist Incidents by Target, 1999-2001



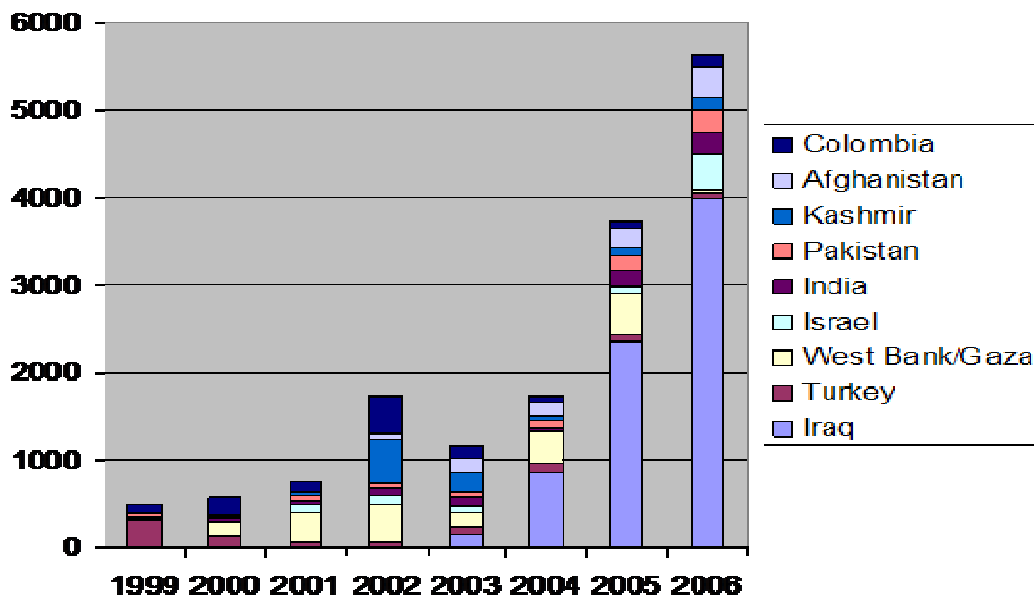
Source: [www.mipt.org](http://www.mipt.org)

Figure 2: Total Terrorist Incidents by Year, 1999-2006



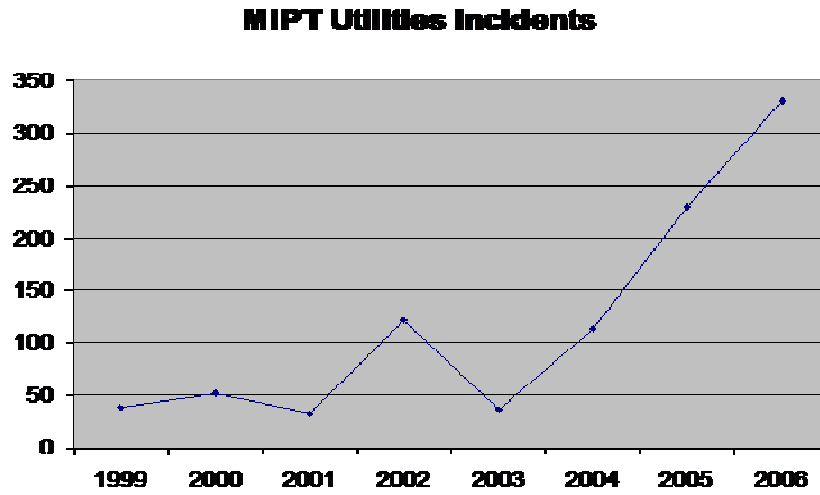
Source: [www.mipt.org](http://www.mipt.org)

Figure 3: Terrorist Incidents by Country of Location, 1999-2006



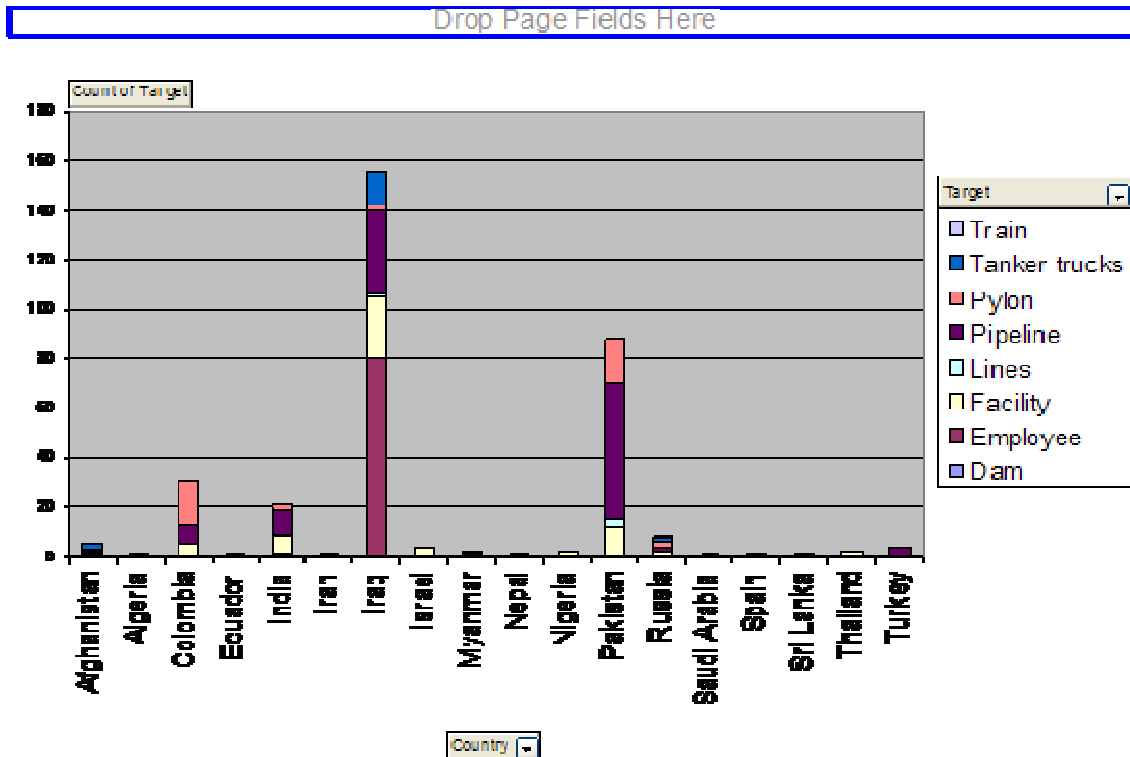
Source: [www.mipt.org](http://www.mipt.org)

Figure 4: Utilities Terrorist Incidents



Source: MIPT

Figure 5: Distribution of Attacks Against Energy Infrastructure, 2006



Source: MIPT

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