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## Article

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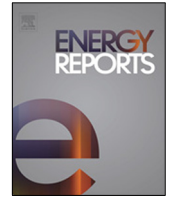
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## Research paper

# Strategic analysis on the construction of new energy corridor China–Pakistan–Iran–Turkey<sup>☆</sup>



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## HIGHLIGHTS

- This paper explores the current situation of cross-border energy pipelines of China, Pakistan, Iran and Turkey. Then it analysis strategic objectives of the four countries.
- It is proposed to build China-Pakistan-Iran-Turkey energy corridor between China, Pakistan, Iran and Turkey, which is of great significance to realize the energy strategic objectives of the countries.
- Through analyzing the key factors influencing the construction of China–Pakistan–Iran–Turkey energy corridor from Strengths, weaknesses, opportunities and threats, it puts forward the strategic countermeasures on the energy corridor construction.

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## ABSTRACT

This paper explores the current situation of cross-border energy pipelines in China, Pakistan, Iran, and Turkey and analyzes the advantages and disadvantages of the current energy corridor and the strategic energy objectives of these four countries. Then it proposes building a new energy corridor between them, which can connect with the world's major energy-producing regions through the border pipeline. Finally, through analyzing the strengths, weaknesses, opportunities, and threats influencing the construction of this new China–Pakistan–Iran–Turkey energy corridor, the paper puts forward strategic countermeasures to deal with the difficulties and challenges of construction.

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## 1. Introduction

Energy is an important resource for world economic development. However, rapid economic development has brought imbalances in energy supply and demand. Thus, energy resources have become an important concern for all countries in the world—one that has the capability to influence world economic trends, patterns, geopolitics, and international relations. Energy has gradually become a leverage in international relations and geopolitics, and so the construction of an energy strategic corridor, as an

important guarantee of energy security, has become the focus of attention worldwide.

Douma et al. (2003) took a spatial approach and defined a transportation corridor as a geographical area between two points, linking multiple centers and moving people and freight. A corridor includes one or more routes that connect centers of economic activity. These routes will have different alignments but with common transfer points and be connected to the same end points (World Bank, 2005). The concept “energy corridor” lacks a precise definition. James MacPherson (2013) defined the concept of the “energy corridor” in North Dakota as a corridor that could move oil, natural gas, electricity, and water out of western North Dakota. In the Statistical Review of World Energy (BP, 2018), energy includes natural gas, oil, coal, and electricity. So, an energy corridor can be defined as a transportation corridor that includes one or more routes between two points, linking energy supply and consumption regions, moving oil, natural gas, coal, and electricity.

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The energy corridor between the Caucasus, Central Asia, and the Economic Union (EU) can reduce the EU's dependence on Russia for energy security, which will be a crucial material benefit for the EU (Meltem and BasKan, 2011). According to the European Commission (2006), the energy corridor between the Caucasus, Central Asia, and the EU can help Turkey to make full use of its potential to become a major energy transit hub. The Central Asia–China energy corridor caters to most of the gas import needs of China, and it also meets the diversification strategy of energy exports of Central Asian countries (Fazilov and Chen, 2013; Higashi, 2009; Kulkarni and Nathan, 2016). Kubicek (2013) analyzed the strategic objectives of the major participants in the Caspian Sea energy corridor. He believed that Russia's goal was to maintain its dominance, the United States' goal was to introduce diversification, China's goal was to grab a piece of the pie, and members of the EU were very interested in diversifying their own energy sources, as they rely at present on Russia for approximately 30 percent of their oil and gas. In summary, the energy corridor plays an important role in realizing the energy strategic objectives of countries along the corridor.

China is the world's largest energy consumer and net importer (Cao and Bluth, 2013; EIA, 2014; BP, 2018). Seeking international energy cooperation, building new energy corridors and supply channels, and diversifying energy corridors and energy import regions are new considerations for China's energy strategic security (Chen, 2009).

Pakistan is adjacent to the Middle East to the west, and central Asia lies to the north, with the east bordering India and China. Several major sea routes from Africa, Europe, through the Red Sea, the Hormuz Strait, and the Persian Gulf, to the Asia-Pacific region pass through the southern coast of Pakistan, so Pakistan is an "energy corridor crossroads" country. However, its own energy supply has been stretched. It hopes to import oil and gas from the Gulf, Western Asia, and Central Asia through pipelines to alleviate the domestic energy dilemma. But the pressure to build an energy corridor to meet domestic energy demand on its own is high, so Pakistan needs to seek international cooperation in the energy sector (Economic and Commercial Counselor's Office, 2014).

Iran is located in the "heart zone" of the Middle East, which is the most convenient way to connect Eurasian maritime traffic, and also the connection point between the Middle East oil region and the Central Asian oil region. Iran is rich in oil and gas resources. The Hormuz Strait is controlled by Iran, which is an important oil and gas import corridor in the Asia-Pacific region. At present, Iran is trying to break the Western economic blockade and political isolation by building a cross-border energy corridor, so as to realize diversified energy exports and guarantee the security of its energy exports (Zhang, 2007).

Turkey lacks energy and its natural gas consumption depends heavily on imports. But being in the middle of the world's largest energy consumer, Europe, and the energy-rich countries of Central Asia and the Middle East, Turkey is in a strategically advantageous position in terms of the energy market (Cetin and Oguz, 2007a,b). Turkey plans to be an energy hub, fitting well with the geopolitical structure of the region (Correlje and van der Linde, 2006). Promoting the diversification of energy sources and striving to build energy hub centers are important energy strategic goals for Turkey.

Therefore, China is an energy importing and consuming country; Pakistan is not only an energy importing and consuming country but an energy transit country; Iran is an energy supplier and transit country; and Turkey is an energy importing and transit country. The energy corridor of China–Pakistan–Iran–Turkey (CPIT) is an energy strategic corridor that connects these four countries. The construction of this corridor fits well with the energy strategic goals of the countries along the corridor.

This paper is organized as follows. Section 2 outlines the existing cross-border energy strategic corridor in China, Pakistan, Iran, and Turkey, and then analyzes the existing advantages and disadvantages. Section 3 outlines the importance of building a CPIT energy corridor and the planning of the CPIT corridor. Section 4 defines the SWOT analysis method, followed by an analysis of the strengths, weaknesses, opportunities, and threats associated with the construction of the CPIT energy corridor. Section 5, through discussing the weaknesses and threats of the corridor construction, puts forward the development countermeasures of the CPIT energy corridor construction to promote multilateral energy cooperation. Section 6 concludes the paper.

## 2. Existing energy corridors of China, Pakistan, Iran, and Turkey

### 2.1. China's energy corridor

At present, China has northwest, southwest, northeast, and sea-lane energy corridors, including Central Asian gas pipelines, the China–Russia oil and gas pipeline, the China–Myanmar oil and gas pipeline, and a marine energy corridor (Fig. 1).

The Central Asia–China gas pipeline (CACGP) is divided into four routes. The annual gas transmission capacity of the A and B routes is 30 billion cubic meters, the C route is 25 billion cubic meters, and the planning D route is 30 billion cubic meters per year. The A, B, and C routes start from the eastern gas fields of Turkmenistan and pass through Kazakhstan and Uzbekistan before reaching Horgos in the Xinjiang region of China (Anceschi, 2010; Global Gas Transport, 2010; Mitchell, 2014). The D route bypasses Kazakhstan, by way of Tajikistan and Uzbekistan, to China. In 2017, it transmitted 36 billion cubic meters of natural gas, which was 39 percent of China's gas imports (BP, 2018). The CACGP caters to most of the gas import needs of China. The Kazakhstan–China oil pipeline (KCOP) was completed in July 2009. Its total planned annual oil transportation capacity is 20 million tons and it spans 1384 miles, running from the Port of Atyrau in northwestern Kazakhstan to Alashankou in China's northwest Xinjiang region. In 2017, the KCOP realized 12.3082 million tons of crude oil transportation to China, with the annual import volume reaching a new high but the export volume still did not exceed the overall pipeline planning and design.

Contrary to the CACGP, the Myanmar–China gas pipeline (MCGP) started operation in July 2013. It is 793 km long and travels through northern Myanmar to the Yunnan province of China (Szep, 2013; Economic Times, 2013). It has a capacity of 12 billion cubic meters of gas per year, which accounts for about 5 percent of China's yearly gas consumption (BP, 2018). The Myanmar–China oil pipeline (MCOP) started operation in May 2017. It is 771 km long and has a capacity of 22 million tons per year. As of February 2019, 17.53 million tons of oil had been transported to China.

The first Russia–China crude oil pipeline (RCOP) was put into operation on January 1, 2011 with the capacity to transport 15 million tons of oil annually. The second RCOP was put into operation on January 1, 2018. It can also transport 15 million tons of oil annually. Meanwhile, the Russia–China gas pipeline (RCGP) includes both the western line and the eastern line. The western line, also known as the Altai gas pipeline, is designed to carry 30 billion cubic meters of natural gas per year. The line is now under negotiation. The eastern line, also known as the Siberia power pipeline, is designed to carry 38 billion cubic meters of natural gas per year. The pipeline is currently under construction and is expected to be operational in December 2019. The western line is a disadvantage for China compared with the eastern line, because Northwest China itself is not a natural gas consumption market,

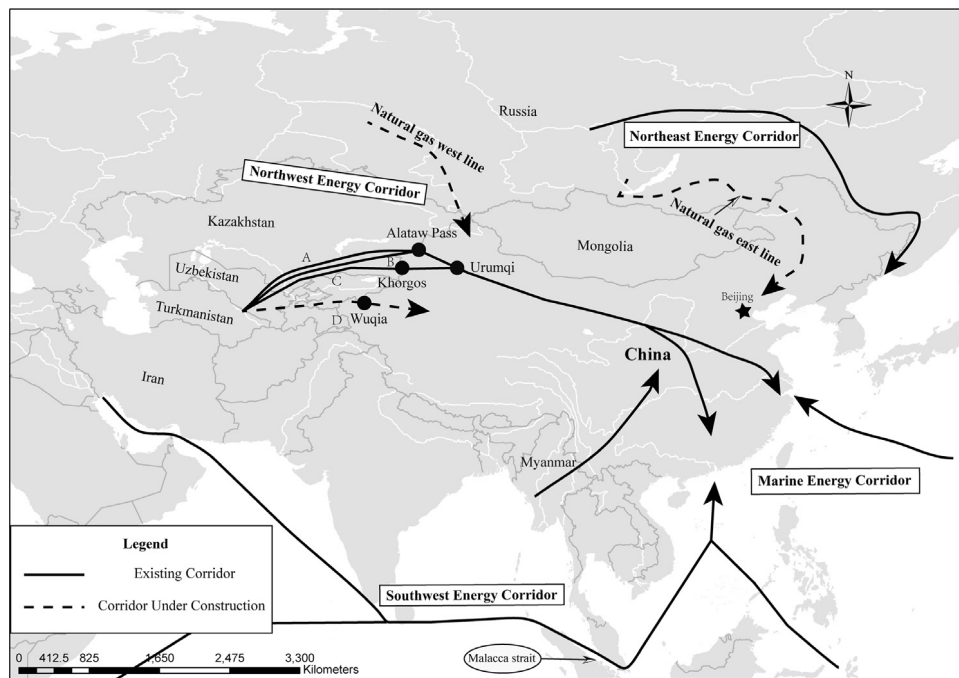


Fig. 1. China's energy strategy corridor.

and Xinjiang also has a lot of natural gas. After entering Xinjiang, the natural gas from the western line will be transported to the southeast. This leads to relatively high comprehensive costs when China imports natural gas from this corridor.

The sea lane has played an important role in transporting oil and gas from Africa and the Middle East to the Chinese market. Currently, there are four shipping routes for crude oil and natural gas imported from overseas. Middle East routes and African routes all need to enter the South China Sea from the Malacca Strait to reach China. Southeast Asia ships to mainland China via the Strait of Malacca and the Taiwan Strait; South America's route is from the Panama Canal to the Pacific and eventually to China. At present, China's single oil import route by sea is highly dependent on the straits of Hormuz, Cape of Good Hope, and Malacca, especially the straits of Hormuz and Malacca, which are the two places where piracy and terrorism are the most prevalent in the world and where ships from all countries have been attacked. In addition, shipping accidents in the Strait of Malacca are particularly prominent, with the accident rate more than three times that of the Suez Canal and more than five times that of the Panama Canal. There are many shallows in the Strait of Malacca, of which 37 are less than 23 m deep. With shipwrecks, drifting sand, silt, and other factors, the waterway situation often changes, which seriously threatens the safety of navigation. Because of the long distance, China's oil imports from Africa will face more attacks and interference from piracy and terrorist incidents, seriously endangering China's oil security.

From the perspective of China's existing energy corridors, these energy corridors are flawed (Table 1). Take the China–Kazakhstan crude oil pipeline as an example. Since it was put into operation in 2006, the accumulated crude oil transportation capacity of the pipeline only exceeded 50 million tons by the end of 2012, and the original designed transportation capacity of this pipeline was 20 million tons per year. The Central Asian natural gas pipeline and the China–Russia oil pipeline, which have been built since then, also failed to reach the expected level of full-load operation. In 2015, China imported 36.2 billion cubic meters of natural gas through the Central Asian pipeline, far below the designed transportation capacity of its several routes.

The China–Myanmar oil and gas pipeline is seen as the key to China's dilemma in Malacca. In 2017, China imported 3.3 billion cubic meters of natural gas through the China–Myanmar pipeline, far less than its designed capacity of 12 billion cubic meters. This is mainly due to the shortage of natural gas supply in Myanmar itself, while the oil transportation capacity designed by the China–Myanmar pipeline is also very limited compared to the import volume through the Strait of Malacca. At present, China's major oil supply still comes from the Middle East and Africa, reaching China through the sea corridor across the Malacca Strait to the South China Sea. As for natural gas, 42.83 percent of it depends on pipelines from Central Asia, Myanmar to China, while the rest is mainly transported by sea to China (BP, 2018). It is difficult to meet domestic energy demand in terms of the oil transport corridor and natural gas supply. Moreover, a single transportation corridor and few suppliers pose huge risks to China's energy security.

Therefore, there are two major problems in China's energy corridors at present. Firstly, the sources of energy cannot be diversified nor can the suppliers of existing energy corridors guarantee sufficient and controllable energy resources. Secondly, the energy transport corridor is dominated by the Malacca Strait, which fails to solve the dilemma of Malacca. China urgently needs to open up a new energy corridor to reduce the reliance on the Malacca Strait.

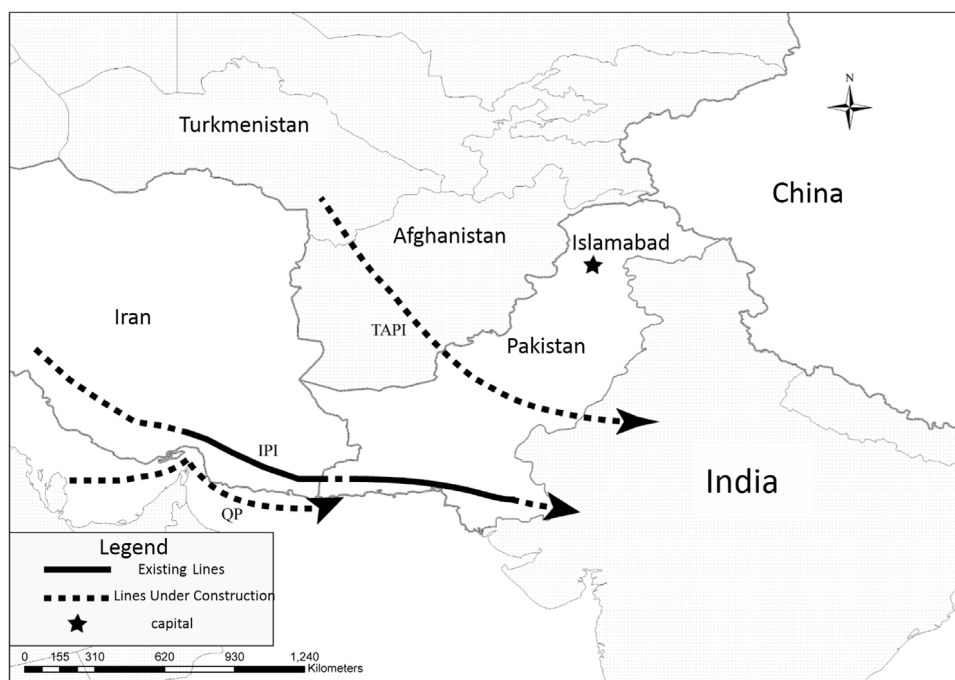
## 2.2. Pakistan's energy corridor

Pakistan has been promoting the construction of transnational oil and gas pipelines since the 1990s. To alleviate the domestic energy dilemma by importing oil and gas from the Gulf, Western Asia, and Central Asia through pipelines, Pakistan plans to build the following three energy pipelines (Fig. 2), but they have yet to materialize.

The Turkmenistan–Afghanistan–Pakistan–India (TAPI) natural gas pipeline begins from a massive gas field in Turkmenistan, passes through war-torn Afghanistan, and reaches Pakistan and India to satisfy the demand of the energy-starved nations. There are several geopolitical impediments, such as pipeline security in

**Table 1**  
Cross-border energy corridor in China.

Origin of corridor	Name of corridor	Capacity/year	Total length	Details	Advantages	Disadvantages
Central Asia	CACGP	85 bcm	1833 km	<b>A</b> started operations in 2009; <b>B</b> started operations in 2010; <b>C</b> started operations in 2014; <b>D</b> will be completed by the end of 2020.	It caters to most of the gas import needs of China. It can avoid Southeast Asia and the Indian Ocean to make China's energy corridor safer (Higashi, 2009; Fazilov and Chen, 2013).	In terms of economic benefits, the import of natural gas from Central Asia has been in deficit since the pipeline was put into operation.
	KCOP	20 million tons	2798 km	It started operations in 2009.	It can reduce China's dependence on Middle East oil; it can make China's oil supply routes safer; finally, it can obtain long-term and stable crude oil supply.	The amount of oil exported to China through the pipeline is insufficient.
Myanmar	MCGP	12 bcm	793 km	It started operations in 2013.	It can improve the energy shortage in Southwest China, ensure the security of energy supply and realize the diversification of gas imports.	Myanmar currently supplies only 4 bcm gas for China a year; two-thirds of the capacity designed must be imported.
	MCOP	22 million tons	771 km	It started operations in 2017.	It mainly transports the crude oil purchased from the Middle East by land, avoiding the Strait of Malacca, greatly shortening the transportation mileage and cost of some Middle East crude oil.	The diversion capacity of MCOP is only 10% of sea transportation.
Russia	RCOP	15 million tons	999.04 km	The first pipeline started operation in 2011.	It can reduce costs and raise the efficiency of China's oil imports from Russia, which had previously relied on rail; it can meet the diversification strategy of China's petroleum supply and ensure energy security.	Russia's concerns about China's rise has brought difficulties for the two countries to continue to deepen cooperation in the oil field.
		15 million tons	941.8 km	The second pipeline started operation in 2018.		
	RCGP	30 bcm	-	The western line is under negotiation.	Importing natural gas from Russia will help China change its energy structure as the nation seeks to boost consumption of gas to cut carbon emissions and rely less on coal.	China gas imports from the western line must be transported to southeast China, which leads to relatively high comprehensive costs compared with the eastern line.
		38 bcm	-	The eastern line is under construction.		
Sea lanes	Malacca Strait; Pacific	-	-	-	Maritime transportation is the lowest-cost way to transport oil over long distances.	Great natural risk; single and few alternative routes; important geostrategic significance and complex security situation.



**Fig. 2.** Pakistan's energy strategy corridor.

Afghanistan and concerns about Russia. An estimated 15,000 to 18,000 security personnel will be needed to provide security to TAPI (Munir et al., 2013). The TAPI pipeline started construction

in December 2015 and is scheduled for completion in December 2019. It will have a diameter of 56 inches and will be 1814 km long, and when operationalized it will carry 33 billion cubic

meters a year, of which India will get approximately 15 billion cubic meters a year (PetroMin Pipeliner, 2011; ADB, 2012; Nathan et al., 2013). By 2020, it is expected to contribute to one-sixth of India's gas demand and 60 percent of its gas imports (IEA, 2013).

The total length of the Iran–Pakistan–India (IPI) pipeline is about 2700 km. After completion, Iran will export 2.8 million tons of liquefied natural gas (LNG) annually. The construction of the Iran section of the pipeline was completed in 2013, but the Pakistan section has not yet started construction. There are divergent interests among the participating countries in the gas pipeline project. India's economic interests are not in congruence with the political, economic, and strategic objectives of Iran and Pakistan (Verma, 2007). Meanwhile, sanctions imposed by Western countries in the Iranian nuclear crisis have brought it to a standstill. With the economic growth of India and Pakistan, the surging demand for energy, and the easing of relations between India and Pakistan, the pipeline has been put back on the agenda. It is suggested that a successful IPI gas pipeline project would require explicit government support from all participating countries. But the fate of the Iran pipeline is still hanging fire. Apart from the US's opposition to the project, there are also differences regarding the pricing of the gas (Verma, 2007).

The Qatar–Pakistan (QP) pipeline was proposed in 1991. Qatar has the fourth-largest gas reserves and the largest LNG export capacity. The two sides had several rounds of consultation, but this scheme did not work in the end because Qatar was not interested. A Qatar gas pipeline to Pakistan through Iranian waters or overland Iran may create interstate rivalry. Therefore, instead of a pipeline, importing LNG from Qatar is a more suitable option (Munir et al., 2013).

Pakistan is extremely short of energy and its energy consumption structure is seriously unbalanced. Its dependence on oil and natural gas products is as high as 79 percent and its annual demand will grow at 5.7 percent and 7.5 percent, respectively. In Pakistan's Vision 2030 (Economic and Commercial Counselor's Office, 2014), the government of Pakistan pointed out that the demand for petroleum and natural gas products in Pakistan would reach 6.84 billion tons and 162.58 billion tons of oil equivalent, respectively, by 2030. The development of oil and gas resources and the stability of supply have a significant impact on Pakistan's social and economic development. But construction of the country's transnational gas pipeline has been affected by geopolitical factors, and its progress has been slow (Table 2). So far, no cross-border energy pipeline has been built in Pakistan. Currently, it mainly relies on shipping to import LNG from Qatar, Yemen, and other countries, and crude oil from the United Arab Emirates and Saudi Arabia to meet domestic energy demand. However, it is still difficult to solve the fundamental problem of energy shortage. There is still a long way to go for Pakistan to diversify its energy sources and energy transport routes.

### 2.3. Iran's energy corridor

Iran's proved oil reserves reached 157.2 billion barrels by the end of 2017, ranking it fourth in the world, accounting for 9.3 percent of the world's total reserves, with a reserve-production ratio of 86.5 years. Its natural gas reserves rank second in the world, accounting for 17.2 percent of global reserves, reaching 33.2 trillion cubic meters (BP, 2018). Iran's economy is highly dependent on the outside world. It is OPEC's second-largest exporter and the world's fourth-largest oil producer. Exports of crude oil and imported consumer goods are the main characteristics of Iran's economy. There are three main transnational oil and gas pipelines in Iran at present. Energy exports are mainly transported by sea. Maritime transportation occupies an important position in Iran's foreign affairs and trade. About 93 percent of Iran's crude oil

exports are transported by sea. Among non-crude oil exports, sea transportation accounts for more than 95 percent (RMTO, 2014). Iran's main oil and gas corridors are shown in Table 3.

The Tabriz–Erzurum–Ankara (TEA) gas pipeline started construction in 1996 after Turkey and Iran signed a gas deal. It runs from Tabriz in northwestern Iran to Ankara in Turkey. In Erzurum, the South Caucasus pipeline is linked to the TEA pipeline. The pipeline officially started operating on July 26, 2001, but the project was not an easy one, facing both economic and political obstacles. It has been blown up several times by PKK guerillas and PJAK terrorists (Reuters, 2007). In 2017, Iran exported about 450 billion cubic feet and imported 170 billion cubic feet of natural gas via pipelines; about 73 percent of total natural gas exports were destined for Turkey. It is an important source of Turkish gas imports and is likely to deliver gas to southern Europe.

The Iran–Iraq–Syria (IIS) pipeline, which is called the Islamic gas pipeline by some Western sources, is a proposed natural gas pipeline running from the Iranian South Pars/North Dome Gas-Condensate field towards Europe via Iran, Iraq, Syria, and Lebanon to supply European customers as well as Iraq, Syria, and Lebanon. The length of the pipeline is 5600 km, and the transport capacity per day and night is 110 billion cubic meters. Syria will buy 2000–2500 million cubic meters of natural gas every day (Table 3). Some of the natural gas will be transported to Lebanon and Jordan through the Arabian gas transportation system. Iran plans to export LNG to Europe through Syria's Mediterranean port. The pipeline would be a competitor to the Nabucco pipeline from Azerbaijan to Europe (UPI, 2011). It is also an alternative to the Qatar–Turkey pipeline, which was proposed by Qatar to run from Qatar to Europe via Saudi Arabia, Jordan, Syria, and Turkey (Nafeez Ahmed, 2013).

The Iran–Iraq oil pipeline runs from Basra in southern Iraq to Abadan in southwestern Iran and is used to deliver Iraq's crude oil to Iran. In addition, the two countries plan to lay another pipeline for transporting petroleum products to Iraq. According to a possible oil exchange agreement between Iran and Iraq, Iraq will transport crude oil to Iranian refineries through the eastern border. In return, Iran will export the same amount of oil through its pipeline in the name of Iraq.

Iran's economy has been badly hit by US sanctions on energy and finance since 2003. So its crude oil production and export strategy has become very clear. Firstly, Iran insists on increasing domestic crude oil production capacity and restoring daily production to the level before the sanctions: 3.5–4 million barrels per day. The second is to persist in increasing crude oil exports and recapture the original market share of crude oil lost by international sanctions (Hou, 2016). Iran strives to enhance its vitality by opening up the South Asian market. Since the 1990s, Iran has begun to consider the construction of a transnational energy corridor linking Pakistan and India. However, the construction of this transnational energy corridor has not been realized. The failure is not only due to the respective interests of Iran, Pakistan, and India, but also to the interests, disputes, and contradictions that are concentrated among the major powers. The conflicts and games between them are very fierce (Peng et al., 2011). Iran seeks to break the economic blockade and political isolation of the West, diversify its energy exports, and ensure the security of its energy exports by building transnational energy corridors. But from the perspective of Iran's cross-border energy corridors, transnational oil and gas pipelines are relatively few, especially oil pipelines. There is only one Iraq–Iran oil pipeline, which is mainly to provide crude oil processing services to Iraq. Therefore, realizing the diversification of the energy export market and energy transport corridor is an important strategic goal for Iran.

**Table 2**  
Cross-border energy corridor in Pakistan.

Origin of corridor	Name of corridor	Capacity/year	Total length (km)	Details	Advantages	Disadvantages
Turkmenistan	TAPI	33 bcm	1814	It is under construction.	It will meet a large part of the country's demand and Pakistan will have surplus power and gas after completion of this project in 2020.	There are several geopolitical impediments such as security of pipeline in Afghanistan and concerns about Russia.
Iran	IPI	2.8 million tons	2700	Undecided	It is estimated that the pipeline will accrue to Pakistan an income of \$14 billion in 30 years, including \$8 billion in transit fees, \$1 billion in taxes, and \$5 billion in savings (Pandian, 2005). It can also ease Pakistan's growing energy needs.	Strong opposition from the US; divergence in gas prices among the three countries; mutual distrust between India and Pakistan; inability to raise sufficient construction funds.
Qatar	QP	–	–	Canceled	It can reduce transportation costs.	It may create interstate rivalry. Qatar is not interested.

**Table 3**  
Cross-border energy corridor in Iran.

Origin of corridor	Name of corridor	Capacity	Total length (km)	Details	Advantage	Disadvantage
Iran	TEA gas pipeline	14 bcm/year	2577	It started operations in 2001.	It is Iran's main natural gas export pipeline.	It has been blown up several times by PKK guerillas and PJAK terrorists.
Iran	IIS natural gas pipeline	110 million cubic meters of natural gas per day	5600	Undecided	It is designed to secure access for the Iranian natural gas to the European energy markets via the Mediterranean.	The war in Syria has a great impact on pipeline safety.
Iran	Iran–Iraq oil pipeline	100,000 barrels per day	–	Out of use	It can improve Iranian crude oil exports.	It has been blown up several times by terrorists in Iran.

#### 2.4. Turkey's energy corridor

Turkey's strategic geographic position is between 47 percent of world energy resources in Russia, Central Asia, and the Middle East and 17 percent of global natural gas consumption in Europe, which makes the country important from both a geopolitical and geo-economic point of view (BP, 2015; Bilgin, 2009). Therefore, Turkey strives to be the Eurasian Energy Corridor between Eastern supply and Western demand (Cetin and Oguz, 2007b). Turkey now has a number of oil and gas pipelines, and it has gradually become an important transshipment center to the EU and other international energy markets for the major oil and gas producing regions in the world, such as Russia, Central Asia, and the Middle East. Turkey plays an important role in safeguarding international energy demand.

The Baku–Tbilisi–Ceyhan oil pipeline (BTC), which runs via Turkey, is the main artery of Caspian oil exports and plays an important role in oil delivery from Azerbaijan, Turkmenistan, and Kazakhstan. The pipeline diversifies the global oil supply and so insures, to an extent, against a failure in supply elsewhere (RIA Novosti, 2005). Although some have touted the pipeline as easing the dependence of the US and other Western nations on oil from the Middle East, it supplied only 1 percent of global demand during its first stage (Skarbo and Petre, 2008; Farid and Akhrarkhodjaeva, 2009).

While the Kirkuk–Ceyhan oil pipeline, also known as the Iraq–Turkey crude pipeline, is an oil pipeline in Iraq and Turkey. The pipeline made Iraq Turkey's largest supplier of oil while providing a vital alternative route for exporting its oil. It was one of the two main routes for the export of Iraqi oil under the Oil-for-Food Program following the Gulf War of 1991. This was in accordance with a United Nations mandate that at least 50 percent of oil exports pass through Turkey. It was even the largest pipeline system in the Middle East at one point (Bowlus and John, 2017). From 2003 to 2008, militants reportedly attacked or sabotaged the pipeline

over 20 times, severely limiting its export capacity (IAGS and OGI-TM, 2008). In 2014, the pipeline was again attacked and damaged after the so-called Islamic State took over large swaths of northern Iraq, closing the pipeline on the Iraq side of the border (U.S. EIA, 2016).

There are two main corridors that carry natural gas to Europe through Turkey, the North–South corridor and the East–West corridor. The Blue Stream pipeline from Russia to Turkey and the TEA pipeline are part of the North–South corridor whereas the Baku–Tbilisi–Erzurum (BTE) and the Turkey–Greece interconnector (ITG) are part of the East–West corridor. The Blue Stream pipeline has been pumping Russian gas to Turkey since 2003 and was scheduled to reach its full capacity of 16 billion cubic meters of gas in 2010 but did not (Barysch, 2007). However, its importance increased in January 2009 when the flow of Russian gas to Ukraine was halted and the Turkish government was able to compensate for the loss in supply by increasing the capacity of the Blue Stream (Meltem and Baskan, 2011).

The BTE pipeline is designed to be the first part of the Trans-Caspian Natural Gas Project, which should eventually transport natural gas from Turkmenistan, Kazakhstan, and Azerbaijan to Europe through Turkish territory. It is similar to the role of the BTC oil pipeline, which carries oil from Azerbaijan's Gunashli oil field to the Turkish port of Ceyhan in the Mediterranean and has become an effective part of Turkey's role as an energy hub. Similarly, the BTE natural gas pipeline is important for changing the Turkish role in European energy security (Meltem and Baskan, 2011). The ITG pipeline was approved in 2004 and carried its first delivery in 2007. It plays an important strategic role in shipping gas from Azerbaijan, Iran, Iraq, and elsewhere to the European market. Through this pipeline, the first amount of Azerbaijani natural gas was delivered to Europe (Austvik and Rzayeva, 2017). There are plans to extend the project to Italy, although there are no specific developments on that yet (Ozan and Direnc, 2015).

But these pipelines (Blue Stream, TEA, BTE, and ITG) are not deemed to be sufficient for the EU's future needs. There are multiple projects for the future of natural gas transport, such as the Trans-Adriatic Pipeline (TAP) and the Trans-Anatolian Pipeline (TANAP), and Turkish Stream. The TANAP, which crosses Turkey between the Turkish–Georgian border and the Marmara Sea, and the TAP are new projects within the context of the Southern Gas Corridor. The supply of natural gas to Turkey started in 2018 and is planned to reach Europe in 2020. The capacity of TANAP will be 31 billion cubic meters a year, which can be extended in three stages. The first phase of the project will provide the EU with 16 billion cubic meters of gas a year, and in the second phase this will be raised to 20 billion cubic meters. TANAP may play a crucial role for Turkey both in covering its own demand and in becoming a transit hub (Austvik and Rzayeva, 2017). TAP was built mainly to carry natural gas from Azerbaijan via the BTE expansion and TANAP but could carry natural gas from Russia or any other source transiting Turkey. The initial capacity of TAP is 10 billion cubic meters a year, all dedicated to Shah Deniz (SD) Phase-2 natural gas and is exempted from the EU Third Party Access requirements for 25 years. Whether an expansion of TAP to 20 billion cubic meters a year to transport Russian natural gas would get an exemption from the EU is not clear (Austvik and Rzayeva, 2017). Turkish Stream was meant as an alternative to the Trans-Balkan pipeline via Ukraine. After the thaw in bilateral relations between Turkey and Russia, it is back on track, but now the plans have been cut from four lines to two lines. One line would serve the Turkish market while a second line would be meant for Southeast European purchasers through a natural gas hub set up by Gazprom with delivery points at Lüleburgaz for the Turkish customer and Ipsala near the Greek border for European customers. Turkish Stream is envisaged to transport 15.75 billion cubic meters a year to the Turkish domestic market and equally large 15.75 billion cubic meters a year as a later second string to European customers (Austvik and Rzayeva, 2017).

As can be seen from the existing cross-border energy corridors of Turkey (Table 4), Turkey is neither a corridor nor a hub for oil and gas now, but the potential to become a corridor or even a hub is there (Ozan and Direnç, 2015). Turkey has every reason to develop new pipeline projects. The country is heavily dependent on Russia for natural gas and it needs an alternative source. Meanwhile, Turkey has played an important role in energy transport only to the EU. So, both energy sources and export markets need to be diversified to consolidate its hub status.

### 3. The China–Pakistan–Iran–Turkey energy corridors

#### 3.1. The importance of building the CPIT energy corridor

China is one of the world's largest energy consumers and importers. Its major oil supply still comes from the Middle East and Africa and reaches China through the sea corridor across the Malacca Strait. As for natural gas, 42.83 percent of it depends on pipelines from Central Asia and Myanmar to China, while the rest is mainly transported by sea to China (Tables 5 and 6). The inadequacy of transportation capacity and supply of oil and gas pipelines between China and Myanmar makes the energy pipeline unable to solve the Malacca predicament in relation to China's energy security. Pakistan's geographic location is significant and plays an important role in shortening transportation distance and reducing transportation costs. The construction of the CPIT corridor will shorten the time and space distance of trade, and effectively enhance China's trade potential with countries along the corridor (Guo and Huang, 2018). Beijing is interested in participating in the extension of the proposed Iran–Pakistan natural gas pipeline to China, for Iran has the richest reserves of gasoline and

natural gas, which provide more potential for cooperation (John, 2013). The IIS pipeline, which will also pass through Lebanon, has been presented as a route to export Iranian natural gas to the shores of the Eastern Mediterranean. The direction of the flow of natural gas, however, can be reversed. Eastern Mediterranean natural gas from the coasts of Lebanon and Syria, possibly even the Gaza Strip and Egypt, can be exported eastward through the pipeline and channeled through Pakistan to China (Nazemroaya, 2013). Thus, Turkey, as an energy hub, can also deliver energy from other regions to China, such as energy from West Africa, North Africa, Azerbaijani, etc. (Table 5). Therefore, the CPIT energy corridor can bypass the high seas and further insure Beijing's energy security by insulating China from the US Navy or any other hostile forces that would try to cut Chinese energy supplies in the scenario of a war (Nazemroaya and Globalresearch, 2010). At the same time, the corridor can expand China's energy sources. The existing energy corridors of Pakistan, Iran, and Turkey can be connected by the CPIT energy corridor to transfer energy from other regions to China. Finally, the CPIT corridor can reduce the transportation cost and distance of China's imported energy.

On the economic horizon, Pakistan's interest in the CPIT corridor is considerable because it is an energy-deficient country, though not as much as China. Energy consumption in Pakistan has grown significantly over the last few decades due to a rapidly growing economy. Energy shortfall seems to be one of the hurdles in Pakistan's quest for economic growth (Asghar and Nazuk, 2007). So far, no cross-border energy pipeline has been built in Pakistan. In response to Pakistan's proposal to allow China to receive gas from the IPI pipeline, Iran showed a positive response, which indicates that, if the project materializes (even without India's participation), and with sanctions against Iran lifted, Pakistan can still enjoy the status of a transit country (Clifford, 2015; Chu, 2016). Through the construction of the CPIT energy corridor, Pakistan can expand its energy sources, diversify its transport routes, and ensure energy supply. On the other hand, as a cross-border energy country, Pakistan can obtain transit costs.

Iran has abundant resources of natural gas and crude oil. Exports of crude oil and imported consumer goods are the main characteristics of its economy, which provide more potential for energy cooperation (EIA, 2007; Asghar and Nazuk, 2007; Nazemroaya and Globalresearch, 2010). The energy and financial sanctions imposed by the United States on Iran since 2003 have severely damaged Iran's economy. Iran could become a substantial global natural gas exporter now that sanctions have been lifted. It has enormous potential, both offshore and onshore (Austvik and Rzayeva, 2017). Iran's big advantage over its rival countries (Qatar and Russia) is that it is situated between two big gas-consumption markets: China and Europe. Through the construction of the CPIT energy corridor, Iran can extend its energy delivery network to Europe, Pakistan, China, and other South and East Asian countries. Setting up an extended network of energy pipelines would help regional security and economic development (Press TV, 2011). Beyond the geo-economic factor, another geopolitical point of view is that Iran can make Turkey and Pakistan, and possibly China, its allies in the West and South Asian regions, thus the so-called monopoly of the US, in the region, can be endangered (Asghar and Nazuk, 2007).

Turkey is an increasingly important transit hub for oil and natural gas supplies as they move from the Caspian region, Russia, and the Middle East to Europe and other Atlantic markets. Fifty-six percent of natural gas and 11 percent of crude imports come from Russia (Figs. 3 and 4). Turkish energy policy is to maintain supply security, upgrade energy-generation facilities based on both imported and indigenous resources and diversify energy import and export channels (Said Arinc and Ibrahim, 2016). For Turkey, transiting large volumes of Russian natural gas to Europe



**Table 4**  
Cross-border energy corridor in Turkey.

Origin of corridor	Name of corridor	Capacity	Total length (km)	Details	Advantage	Disadvantage
Azerbaijan	BTC	1.2 million b/d	1768	It started operations in 2006.	It constitutes an important leg of the East–West energy corridor, gaining Turkey greater geopolitical importance.	It supplies 1 percent of the world's oil needs and cannot ease the dependence of the US and other Western nations on oil from the Middle East.
	BTE	6.6 bcm/year	690	It started operations in 2008.	It is important for changing the Turkish role in European energy security.	It is directly affected by regional conflicts and Russian interference in Caucasian politics.
Iran	TEA	14 bcm/year	2577	It started operations in 2001.	It is an important source of Turkish gas imports.	It has been blown up several times by PKK guerillas and PJAK terrorists.
The southern natural gas corridor proposed by the EU.	TANAP	31 bcm/year	1850	It is expected to start operations in 2019.	It may play a crucial role for Turkey both in covering its own demand and in becoming a transit hub.	Insurgents in Turkey and in neighboring countries may attack the pipelines.
	TAP	10 bcm/year	878	It is expected to start operations by 2020.	TAP will play an important strategic role in shipping gas from Azerbaijan, Iran, Iraq and elsewhere to the European market.	Insurgents in Turkey and in neighboring countries may attack the pipelines.
	ITG	8 bcm/year	296	It started operations in 2007.	It is important for changing the Turkish role in European energy security.	Little progress has been made on extending the line through Greece and to Italy.
Russia	Blue Stream	16 bcm/year	1213	It started operations in 2003.	It ensures the diversification of the EU's natural gas supply and transportation and improves Turkey's importance to the EU's energy security.	The pipeline makes Turkey more dependent on Russian energy.
	Turkish Stream	31.5 bcm/year		The first line will start in 2019.	It is an alternative to the Trans-Balkan pipeline via Ukraine.	The plans have been cut from four lines to two lines.
Iraq	Kirkuk–Ceyhan	1.6 million b/d	970	It started operations in 1976.	It made Iran Turkey's largest supplier of oil.	The Iraqi part of the pipeline has been a principal sabotage target since 2003.

**Table 5**  
China's crude oil and LNG import sources in 2017.  
Source: BP Statistical Review 2018.

China	America	Europe	Russia	Other CIS countries	The Middle East	North Africa	West Africa	Central and South Africa	Australasia	Other Asia-Pacific countries	Total imports
Crude oil (million tons)	66.8	9.9	59.8	3.8	184	5.6	72.3	4.7	2.1	13.3	422.3
LNG (bcm)	2.4	0.7	0.6	–	10.6	0.2	0.5	0.5	23.7	13.5	52.7

**Table 6**  
China's natural gas import sources through pipelines in 2017.  
Source: BP Statistical Review 2018.

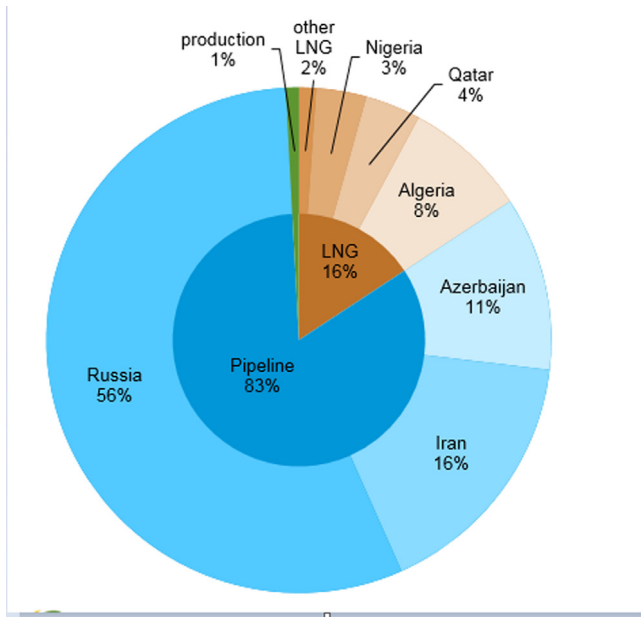
China	Kazakhstan	Turkmenistan	Uzbekistan	Myanmar	Total imports
Pipeline natural gas (bcm)	1.1	31.7	3.4	3.3	39.5

gives almost no capacity expansion for Turkish domestic East–West infrastructure, and leaves the country more dependent on Russian natural gas for a longer time. This would reduce, or at least challenge, its chance of growing as a transit hub at the crossroads of the Middle East, the Caspian Sea, and Europe (Kim and Blank, 2015). Turkey is a corridor country; Iran is a producer country. If we fuse both potentials, Turkey could become an energy provider corridor. The construction of the CPIT energy corridor will not only enable Turkey to expand the transportation of Iranian oil and gas resources to Europe, but also enable it to transport oil and gas resources from North Africa, West Africa, and the Caspian Sea to Pakistan and China. Thus, it would reduce Turkey's energy dependency on Russia and diversify its energy import and export channels.

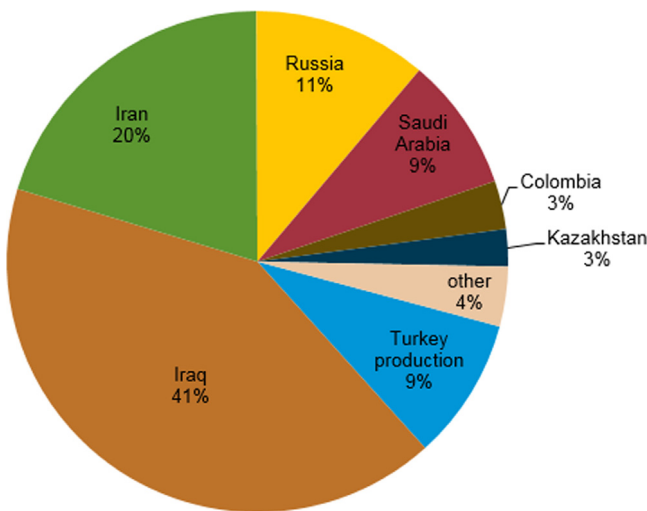
### 3.2. Energy corridor planning of CPIT

The CPIT energy corridor is an energy strategy corridor connecting China, Pakistan, Iran, and Turkey (Fig. 5). It is a strategy proposed in response to China's "the Belt and Road" initiative (BRI). The transportation forms of this energy strategic corridor can be diversified, consisting of highway, railway, and pipeline and water transportation. Promoting energy infrastructure connectivity is an important part of BRI construction. Energy cooperation can not only meet the demand of China's stable economic development, but also promote the BRI strategic development pattern, develop interconnected transmission lines and transportation systems, and drive regional economic and financial cooperation along the belt and road.

Kashgar, the border port of Xinjiang in Western China, is also the domestic entry port of oil and gas pipelines of the China–Pakistan economic corridor. Oil and gas pipelines constructed by



**Fig. 3.** Turkey natural gas supply by source, 2015.  
Source: U.S. Energy Information Administration based on BP Statistical Review 2016.



**Fig. 4.** Turkey crude and condensate supply by source, 2015.  
Source: U.S. Energy Information Administration based on International Energy Agency, Monthly Oil Data Service.

China and Central Asian countries enter Xinjiang from Khorgos and pass through the Kashgar region. These lines, together with other energy pipelines in China, form a huge energy transmission network in Western China. They lay a foundation for realizing the integration of China's energy imports from sea and land.

Gwadar Port in Pakistan is the key node of the China–Pakistan oil and gas pipeline. It is about 400 km from the Strait of Hormuz and is a deep-water port for berthing 80–100,000 tons of oil tankers. The overland route of Middle Eastern oil into China's Xinjiang region would be 85 percent shorter and cheaper than the transport of oil around the Malacca Strait.

The Iranian section of the peace pipeline from Iran to Pakistan has been completed. On the one hand, oil and gas resources from Iran to China can be transported by land through Gwadar Port; on the other hand, they can be transported through Iranian

domestic oil and gas pipelines to the Iran–Pakistan border, and then through Pakistan domestic oil and gas pipelines to China. Thus, the mode of oil and gas transportation is mainly formed by pipeline transportation, supplemented by railway and water transportation.

Turkey has a well-developed oil and gas pipeline network, which links it with the major energy-producing areas in Central Asia, Russia, and the Middle East. Through cross-border energy pipelines, Turkey can play a pivotal role in transporting oil and gas resources from other regions to China and Pakistan.

As a whole, Pakistan and China are the major energy import and consumption countries; Iran is the major energy supplier; and Turkey is the energy transit country. The corridor passes through Iran, a major energy-producing region in the Middle East. At the same time, through the cross-border energy pipeline between China, Pakistan, Iran, and Turkey, it is connected to the major energy-producing regions in Central Asia, Russia, and the Middle East. On the one hand, the corridor fulfills the diversified demand for energy imports in energy-importing countries and changes the regional energy strategic pattern. On the other hand, the transportation channels of energy are diversified. In addition to the traditional shipping, the transportation of energy to Pakistan and China can be combined by sea and land transportation, road and pipeline. Finally, it can expand the energy export markets of energy suppliers and transit countries to achieve their goals of diversifying energy exports. It can transfer the energy of Turkey and Iran to the markets of South Asia, Southeast Asia, and East Asia, as well as the energy of Iran to the European market through Turkey.

#### 4. The SWOT analysis on the CPIT energy corridor

##### 4.1. Methodology

SWOT analysis has its origins in the 1960s (Learned et al., 1965), emerging in the field of economic analysis. Since then it has extended to various forms of research and nowadays is the key tool used to explain the internal (strengths, weaknesses) and external (opportunities, threats) factors of business development and to build a management strategy (Markovska et al., 2009; Pesonen and Horn, 2014). SWOT analysis is valuable for the evaluation of management procedures in companies, projects, and plans (Samolada and Zabaniotou, 2014). It helps organizations, projects, and even individuals to systematically analyze strategic situations, so that they can then develop and adopt a strategy that will build on the strengths, eliminate the weaknesses, exploit the opportunities, and counter the threats (Gao and Peng, 2011; Dyson, 2004).

Therefore, SWOT analysis is used to identify the strengths, weaknesses, threats and opportunities of the proposed CPIT energy corridor project, which is mainly based on the relevant research literatures of scholars and the actual statistics. Through the analysis of the current situation and existing problems that the proposed CPIT energy corridor could face during further development, this paper puts forward the corresponding solutions according to the SWOT analysis matrix from the perspective of China.

##### 4.2. SWOT analysis on the CPIT energy corridor

###### 4.2.1. The strengths

###### 1. Policy advantage

In September and October 2013, during his visits to Central and Southeast Asian countries, Chinese President Xi Jinping put forward the strategic ideas of jointly constructing the “Silk Road Economic Belt” and the “21st Century Maritime Silk Road”, which

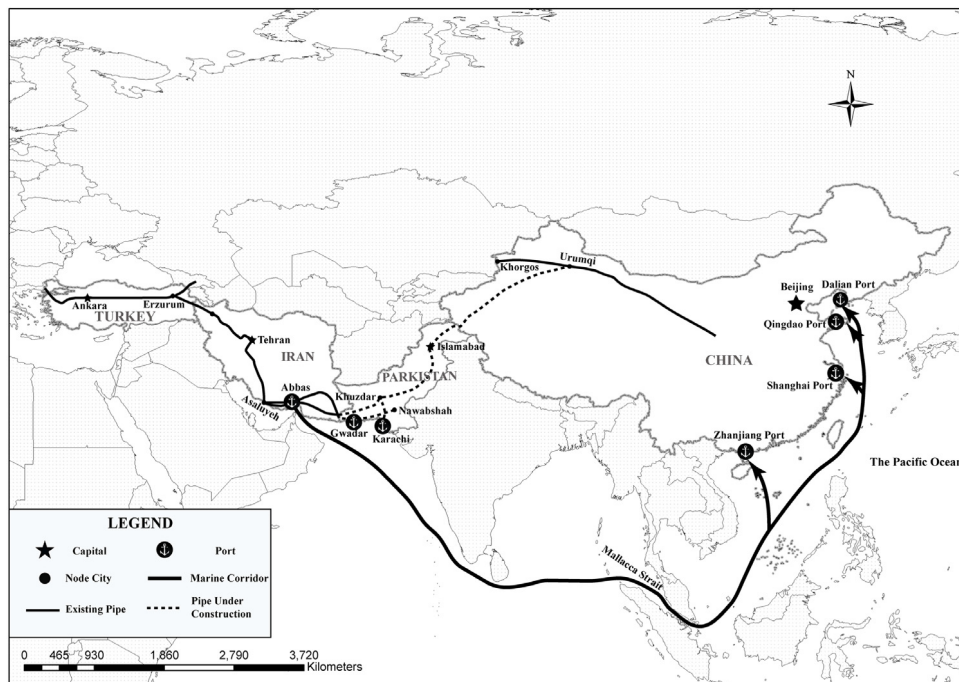


Fig. 5. Schematic diagram of CPIT energy strategic corridor.

received positive responses from more than 100 countries and international organizations. Since then more than 50 intergovernmental cooperation agreements have been signed with countries and international organizations, including Pakistan, Iran, and Turkey.

The interconnection of energy, transportation, and telecommunications infrastructure is the priority area of the Belt and Road initiative (BRI), mentioned earlier. The China–Pakistan economic corridor, as a useful supplement to BRI, is a trade corridor that includes highways, railways, oil and gas, and optical cable channels. It is also an important part of BRI. Iran, on the other hand, is actively cooperating with China's BRI, presenting good momentum with “five links”—namely, policy, trade, capital, infrastructure, and people's mind (Wang, 2016). On November 15, 2015, China and Turkey signed a memorandum of understanding on the construction of the BRI. At the same time, at the summit forum of BRI, China and Turkey signed an international transport and strategic docking agreement, which provided important policy support for the two sides to promote cooperation in various fields within the BRI framework (People's Daily, 2017).

## 2. Abundant energy resources

The CPIT corridor is rich in energy resources along the energy corridor. Iran is the connecting point between the Middle East oil and gas region and the Central Asia oil and gas region. It has abundant oil and gas resources. It is the second-largest oil and gas exporter in the world. The Hormuz Strait, controlled by Iran, is an important passage for oil and gas imports to the Asia-Pacific region. Hundreds of oil tankers pass through it every day to transport oil out of the Middle East by water. Hormuz Strait is therefore called the “total valve of the oil depot” in the Middle East. Turkey, as the world's energy-transfer hub, has a large number of oil and gas pipelines connecting Russia, Central Asia, the Caspian Rim, the Middle East, and other major oil and gas production areas in the world. Through the cross-border energy corridor of the countries along the CPIT strategic corridor, the oil and gas resources of the Middle East, Central Asia, Caspian Sea Rim, and Russia, which are the main oil and gas producing

areas in the world, can be transported to other countries along the corridor.

## 3. Geographic advantage

The CPIT strategic energy corridor will help to build an international economic corridor linking China with South Asia, West Asia, Europe, and Africa, and open up the international strategic corridor of the New Silk Road. From the perspective of geography, Pakistan – being adjacent to the Middle East to the west, Central Asia to the north, India and China to the east – is a “crossroads of energy passages”. Several important sea routes from Africa and Europe to the Asia-Pacific region all pass through the south coast of Pakistan. Iran is located in the “heart zone” of the Middle East, which is the most convenient way to connect the Eurasian maritime traffic and the connecting point between the Middle East oil and gas region and the Central Asia oil and gas region. The controlled Hormuz Strait is an important passage for oil and gas imports in the Asia-Pacific region and an important transportation hub. As Turkey is located in the middle of Eurasia, its geographical position is very special, and its strategic position is extremely important. It is not only a necessary place for the ancient Silk Road, but also a land, sea, and air transport hub in the Middle East. It has the traffic conditions for the reconstruction of the Silk Road. Istanbul, the largest city in Turkey, has always been the main city of communication between Eastern and Western civilizations.

## 4. Energy complementary advantages

China is the world's largest energy consumer and net importer. In 2017, its natural gas imports reached 92 billion cubic meters, and its external dependence increased to 39 percent; oil dependence reached 68 percent; and net oil imports reached 453.8 million tons, increasing the demand for foreign energy (BP, 2018). Pakistan's own energy supply has been tight for years, and it hopes to ease the domestic energy dilemma by importing oil and gas from the Gulf, West Asia, and Central Asia in pipelines. But building energy corridors to meet domestic energy demand on its own is clearly putting it under pressure, so Pakistan needs to seek international cooperation in the energy sector

(Economic and Commercial Counselor's Office, 2014). Iran's economy is highly dependent on foreign countries. Exporting crude oil and importing consumer goods are the main characteristics of Iran's economy. The energy and financial sanctions imposed by the United States on Iran since 2003 have severely damaged Iran's economy. At present, Iran is trying to develop its economy by increasing energy exports (Hou, 2016). In 2015, 89 percent of Turkey's oil and 98 percent of its natural gas consumption depended on imports (BP, 2016). Turkey's advantageous geographical position also made it strive to build an East–West energy hub. It needs a stable energy source market and energy export market.

#### 4.2.2. The weaknesses

##### 1. Transport infrastructure needs to be improved

At present, the level of transport infrastructure in the countries along the corridor is uneven, and the construction of transport infrastructure needs to be upgraded (Table 7). Highway network density and railway network density in Pakistan and Iran are relatively low. At the same time, the existing railway electrification rate and double-track rate are too low. Most of the lines belong to a single-track railway, and have not been electrified, which directly affects transport efficiency. The development of Turkish railways is relatively lagging behind. At present, the total railway length of Turkey is less than 10,000 km, so there is still considerable room for Turkey to improve to become an East–West transport hub. Therefore, building and improving the transportation infrastructure system is the key task of all countries along the corridor.

##### 2. Insufficient infrastructure connectivity

At present, countries along the CPIT corridor have a road network foundation. China and Pakistan are connected by the Karakoran Highway, which connects China's Kashgar and Pakistan's Thakot. The Karakoran Highway is being rebuilt and expanded. A road link has been realized between Pakistan–Iran–Turkey, but the existing road grades are low, and the road needs upgrading.

Regarding railway connection, there is no railway connection between China and Pakistan at present, and the China–Pakistan economic corridor railway is in the preliminary planning stage. There is a railway connection between Pakistan's southwest Quetta and Iran's Zahedan, but there are no actual trains due to the two countries' policies. There is a railway link between the northeastern Iranian city of Khoy and the Turkish city of Van. At the same time, the rail widths along the corridor are different, and the transshipment of goods will reduce the efficiency of railway transportation. The challenges brought by the differences in railway infrastructure must be overcome.

As for the connection of cross-border oil and gas pipelines, the China–Pakistan economic corridor project currently implemented in China has put forward the construction of the natural gas pipeline project, Gwadar Port–Nawabshah–Kashgar. The Iran–Pakistan section of the Iran–Pakistan–India natural gas pipeline has been constructed, and part of the pipeline in Iran was constructed in March 2016, while Pakistan failed to complete construction as expected. The pipeline from Iran to Ankara, the capital of Turkey, runs from Tabriz in Northwest Iran to Ankara in Turkey, part of which passes through areas frequently attacked by the Kurdish Workers' Party in eastern Turkey. The infrastructure construction of the CPIT pipeline is still insufficient.

#### 4.2.3. The opportunities

##### 1. Achieving national energy strategic goals

At present, China's energy demand is increasing. It is a new consideration for China's energy strategic security to seek international energy cooperation, construct new energy transport

channels and energy supply channels, and realize the diversification of energy transport channels and energy import areas (Chen, 2009; Lang et al., 2012). Through the construction of the CPIT strategic energy corridor, on the one hand, China can diversify its energy sources. It can import oil and natural gas from countries around the Caspian Sea such as Azerbaijan and Georgia through Turkey, which is an energy transport hub. On the other hand, it can diversify its energy transport corridors and form multiple transport corridors: Caspian Sea energy country–Turkey–Iran–Pakistan–China by land transport; Middle East oil and gas–Iran–Pakistan–China by land transport; Middle East–Hormuz Strait–Pakistani Gwadar Port–China by sea and land; West Asia and North Africa–Pakistani Gwadar Port–China by sea and land; Central Asia (Turkmenistan)–Afghanistan–Pakistan–China by land transport. This will greatly alleviate and reduce the pressure and risks of oil and gas import corridors, which are highly dependent on the Malacca Strait.

Pakistan's own energy supplies have been stretched for many years. Pakistan hopes to import oil and gas from the Gulf, West Asia, and Central Asia through pipelines to alleviate the domestic energy dilemma. However, for Pakistan, it is obviously difficult to establish energy corridors to meet domestic energy needs on its own, so it needs to seek international energy cooperation (Economic and Commercial Counselor's Office, 2014). The construction of this energy corridor can guarantee the diversification of energy supply and transport channels in Pakistan. Through Turkey and Iran, Pakistan can import oil and gas resources from the Caspian Sea, Russia, the Middle East, and other major global energy-producing areas, which can realize the diversification of energy transport corridors. At the same time, it can realize multimodal transport modes, such as sea transport, land and water combined transport, and land pipeline transport.

At present, Iran is trying to break the Western economic blockade and political isolation by building a cross-border energy corridor, so as to diversify its energy exports and ensure the safety of its own energy exports (Hou, 2016). By building the CPIT corridor, Iran can diversify its energy exports and transportation channels, stabilize the market, and ship its oil and gas to South Asia and East Asia, as well as European countries through Turkey, so as to consolidate its political position in the Middle East. At the same time, the pipeline from Iran to Turkey can transport oil and gas from the Middle East and Central Asia to Europe or South Asia and East Asia, making Iran a hub for energy transmission between the East and the West, establishing its global oil strategic position.

Turkey is a country with a shortage of energy resources, which makes it heavily dependent on foreign energy resources. However, due to its advantageous geographical position, Turkey promotes the diversification of energy sources. It is an important energy strategic goal for Turkey to promote the diversification of energy sources and build energy hubs. The CPIT corridor can open up Turkey's Southeast Asian and South Asian markets, diversify its energy export markets, strengthen its strategic position in energy, expand its influence in the Middle East, and even make it a global energy hub; at the same time, the CPIT is conducive to safeguarding its own energy supply, and obtaining oil from the Middle East or Turkmenistan through Iran. Thus, Turkey can realize its diversification of energy source and transportation corridor.

##### 2. Energy industry cooperation

Pakistan's energy industry is relatively backward, its enterprises lack capital and technology, and the country's power shortage is large. China's energy industry is developed, and the two sides strongly complement one another. The participation of Chinese-funded enterprises in Pakistan's power construction can reduce their dependence on oil and gas power generation, and the relevant power generation and grid enterprises can also

**Table 7**

Status quo of transportation infrastructure in China, Pakistan, Iran and Turkey.

Source: Data sources: Ministry of Transport website of the People's Republic of China and Ministry of Commerce website of the People's Republic of China; Guidelines for Countries (Regions) of Foreign Investment Cooperation (Iran 2015 edition); Guidelines for Countries (Regions) of Foreign Investment Cooperation (Turkey 2015 edition).

Infrastructure	Indicators	China (2015)	Pakistan (2014)	Iran (2014)	Turkey (2013)
Highway	Total mileage	4.577 million km	264000 km	200,000 km	389,000 km
	The density of road network	0.48 km/km <sup>2</sup>	0.32 km/km <sup>2</sup>	0.15 km/km <sup>2</sup>	0.49 km/km <sup>2</sup>
	Total expressway mileage	123500 km	710 km	1957 km	2127 km
Railway	Total mileage	121000 km	7791 km	13000 km	9718 km
	The density of railway network	1.26 km/100 km <sup>2</sup>	0.98 km/100 km <sup>2</sup>	0.79 km/100 km <sup>2</sup>	1.24 km/100 km <sup>2</sup>
	Technical grade	Double-track rate: 52.9%	Double-track rate: 15%	Double-track rate: 7%	Double-track rate: 10%
		Electrification rate: 60.8%	Electrification rate: 3.8%	Electrification rate: 2%	Electrification rate: 25%

obtain economic benefits (Yang, 2015). The current strategic goal of Iran's oil and gas sector is to increase production capacity, exports, and share of the international market. However, the biggest problem is the lack of funds, technology, and equipment. China can participate in the exploration and development of Iran's oil and gas projects and change the current situation where purchasing Iranian crude oil is the most important form of cooperation (Lu, 2015; Mu, 2016). Due to the limited domestic available energy, Turkey is highly dependent on foreign energy sources. Therefore, it is trying to improve energy efficiency through the development of nuclear power plants. China's nuclear power technology has significant advantages, which will accelerate China–Turkey cooperation so that they can build the energy corridor together (Gao, 2016).

### 3. Promoting economic and cultural exchanges and cooperation between countries along the corridor (Seljuk Colakoglu, 2014)

The construction of the CPIT corridor can realize the inter-connection of infrastructure between the countries along the corridor. On the one hand, it is conducive to the countries along the corridor seeking regional sales channels and expanding the scale of trade between them. On the other hand, the economic and social conditions of the countries along the corridor are complementary to China. The construction of the corridor will inevitably bring complementary economic development and the transformation of the industrial layout along the corridor. Finally, it will promote ethnic, religious, and tourism exchanges and cooperation between the countries along the corridor.

#### 4.2.4. The threats

##### 1. Ethnic and religious contradictions are complex and non-traditional factors of insecurity are prominent

China is a multi-religious country. Taoism, Buddhism, Christianity, and Islam are the four major religions. Pakistan is a country with a strong religious atmosphere where Islam is regarded as the state religion; more than 95 per cent of residents are Muslim, 95 percent of whom are Sunnis, with a Shia minority. In Iran, 98 percent of citizens are Muslim, 91 percent of whom are Shiites, and the rest are Sunnis. Unlike other Islamic countries, Turkey has a relatively relaxed religious climate, with 99 percent of its inhabitants Muslim, 85 percent of whom are Sunnis and the rest Shiites. Various religions and beliefs coexist in the countries along the corridor. At the same time, there are different religious denominations within some religions. The historical disputes among different nationalities and religions are complicated. International terrorism, religious extremism, ethnic separatist forces, and transnational organized crime are rampant in some areas. The regional situation has been unstable for a long time, increasing the difficulty of countries along the corridor to cooperate with construction.

##### 2. Political environment in countries along the corridor is unstable

Pakistan's politics have long been turbulent. On the one hand, this is due to internal disputes within the regime; on the other hand, there are also extremely sharp contradictions with India in terms of geography and culture. The entrenchment of Afghan Taliban forces on the northern edge of Pakistan also brings great trouble to the country's politics (Tyler Hooper, 2013). Although Pakistan and Iran are neighbors, it is very difficult to build regional mutual trust because of their different geopolitical priorities and the “Baluchistan” issue.

Iran's conservatives and reformists are at loggerheads. In June 2009, Ahmad Ahmadinejad, the conservative leader, was re-elected in the 10th presidential election, bringing the struggle between the two factions to its zenith since the Islamic Revolution, with large-scale demonstrations and violent clashes. Each electoral process sharpens tensions between the two parties. Now that Iran's Supreme Leader Ayatollah Khamenei is old, this further deepens the instability of Iran's future political situation (Yin and Gao, 2013). Over a long period, Iran's and Turkey's different positions on Syria and Kurdistan have brought “regional structural hostility”, creating an uneven relationship of long-term conflict and short-term cooperation (Wang, 2011).

Since the beginning of the 21st century, Turkey's democratic system has increasingly faced the challenge of being torn apart by religious conflicts, which has a negative impact on the long-term stability of the country. Meanwhile, the relationship between the military and the Zhengfa government and between secularism and conservatism have always led to political and social instability in Turkey. To summarize, the instability of the political environment of the countries along the corridor poses a certain risk to the construction of the CPIT corridor.

#### 5. Recommendation

In view of the strengths, weaknesses, opportunities, and threats of the proposed CPIT energy corridor, this paper puts forward the following strategic countermeasures for the construction and development of the corridor.

##### 1. Strengthen policy connectivity, improve top-level design, and enhance energy and transportation infrastructure construction and interconnection.

China, Pakistan, Iran, and Turkey should strengthen inter-governmental communication and cooperation, actively build a multilevel inter-governmental macro-policy communication and exchange mechanism, fully exchange and dock the development strategies and countermeasures for the construction of an energy corridor, jointly formulate plans and measures for promoting regional cooperation, and seize the key nodes and projects of transportation infrastructure. At the same time, the four countries need to promote the establishment of a unified transport coordination mechanism, promote international customs clearance, transshipment, multi-modal transport organic link, to achieve international transport facilitation. Finally, they should

promote port-infrastructure construction, open land–water inter-modal transport corridors, and promote port cooperation, so as to provide policy support for the construction of the CPIT energy corridor.

## **2. Strengthen ethnic, religious, and cultural exchanges and promote people-to-people connectivity.**

Religious culture has a profound impact on political, economic, cultural, and international relations along the CPIT corridor. Religion is the greatest spiritual intersection among the people of the countries in this corridor, who adhere to different religions and sects. An important way to bridge the divide and resolve contradictions is through folk religious groups. Therefore, China, Pakistan, Iran, and Turkey should turn their perspectives to the dimension of religion, direct their actions to the realm of religion, and above all attach importance to cultural exchanges and people-to-people connectivity. Benign exchanges and cooperation between religious groups will lubricate the society of the four countries, thus enhancing mutual understanding and trust, and promoting the sort of strategic cooperation necessary to build an energy corridor between China, Pakistan, Iran, and Turkey.

## **3. Promote the establishment of regional security cooperation system to ensure the safety and operation of energy corridor.**

Countries along the CPIT corridor should strengthen regional security cooperation, cope with anti-terrorism and conflict interference factors along the corridor, and reduce the risks facing the corridor. First of all, China can advocate that the countries along the corridor should establish joint anti-terrorism centers to achieve the goal of anti-terrorism intelligence sharing and anti-terrorism cooperation, and jointly respond to the threat of terrorist forces. Secondly, by relying on some regional security organization and security mechanism, they should promote the construction of a regional security cooperation system such as the Shanghai Cooperation Organization (SCO). China and Pakistan are among the member states of SCO. Iran is an observer country and Turkey is a dialogue partner. The aim is to strengthen mutual trust and good-neighborliness among the member states. They are jointly committed to maintaining and safeguarding peace, security, and stability in the region. The member states are also cooperating closely to implement the Convention on Combating Terrorism, Separatism and Religious Radicalism. At the same time, in order to ensure the safety of projects, they should establish a security barrier for the protection of project assets and overseas workers in troubled areas, mainly local government construction projects that rely on UN peacekeeping forces. Finally, the frequent occurrence of terrorism is due to the backward economic development of the region and the large gap between rich and poor. Therefore, the countries along the corridor should realize all-round cooperation on the basis of the principle of “consultation, co-construction and sharing” (Zhang, 2016), increase investment in social infrastructure, enhance social welfare, narrow the gap between rich and poor, and promote the sustainable economic development of the countries along the corridor.

## **4. Adhere to principles and institutionalize energy strategic cooperation.**

The instability of the political environment in countries along the corridor mainly lies in disputes between countries in the region based on historical reasons and political instability based on practical issues. In this regard, China should adhere to the principle of “shelving disputes for common development”. It should take into account the economic interests of the disputed countries and resolve them through bilateral or multilateral consultations. In the face of political turmoil in the relevant countries in the region, China should always adhere to the principle of “non-interference in internal affairs” and play a constructive role in pushing relevant parties to resolve the issue peacefully

and maintain regional stability (Liu, 2015). At the same time, it should attach importance to the energy strategic objectives of the countries along the corridor, formulate rules for cooperation and systems for energy strategic corridor construction through dialogue and exchange mechanisms. It should institutionalize energy strategic cooperation, achieve mutual benefit, gradually build trust, and jointly meet the challenges facing the construction of the corridor.

## **6. Conclusion**

Through analyzing the current situation of the cross-border energy corridor in China, Pakistan, Iran, and Turkey, this paper analyzes the advantages and disadvantages of the existing energy corridor and energy strategic objectives of each country. It argues that there are two main problems in China's energy corridor: one is that the sources of energy cannot be diversified nor can the suppliers of existing energy corridors guarantee sufficient and controllable energy resources; the other is that the energy transport corridor is dominated by the Malacca Strait, which fails to solve the dilemma of Malacca. China urgently needs to open up new energy channels to reduce the reliance on the Malacca Strait. Seeking international energy cooperation, building a new energy transport corridor and energy supply channels, and diversifying the energy transport corridor and energy import regions are new considerations for the strategic security of China's energy. The construction of transnational natural gas pipelines in Pakistan is affected by geopolitical factors, and progress is very slow. It is still difficult to solve the fundamental problem of energy shortage. Pakistan needs to seek international cooperation in the field of energy to diversify its energy sources and transportation corridor. Iran has relatively few transnational oil and gas pipelines, especially oil pipelines, with only one Iraq–Iran pipeline, which mainly provides crude oil processing services to Iraq. Diversification of the energy export market and transportation corridor are important strategic objectives for Iran. Turkey has gradually developed into an energy transmission hub; it mainly plays an important role in energy transport to the European Union. An important strategic goal for Turkey is to promote the diversification of energy sources, expand the energy transmission market, and strive to build an energy hub.

Afterwards, the paper analyzed the importance of having a CPIT energy corridor, defined the corridor, and put forward the idea of building a CPIT energy corridor. The construction of this energy corridor would play an important role in achieving the energy strategic goals of all countries along the corridor.

Then the strengths, weaknesses, opportunities, and threats in corridor construction were analyzed. The article holds that the construction of the CPIT energy corridor has strong internal strengths, including policy advantages, energy resource advantages, geographic advantages, and complementary advantages. It would bring better opportunities and conditions to all countries along the corridor, help to achieve the energy strategic objectives of the countries, make use of the advantages of each country to achieve energy–industry cooperation, and thus promote economic and cultural exchanges and cooperation. However, as well as giving countries opportunities, countries along the corridor also have weaknesses and threats that need attention, such as inadequate transport infrastructure construction, inadequate infrastructure connectivity, ethnic and religious contradictions, and instability in the political environment.

In sum, the construction of the CPIT energy corridor is in line with the energy strategic objectives of China, Pakistan, Iran, and Turkey. Although there are weaknesses and threats associated with the construction of the corridor, opportunities still exist. Countries along the corridor should strengthen cooperation from the perspectives of policy connectivity, people-to-people connectivity, energy cooperation mechanisms, and security cooperation.

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