Investment screening: Implications for the energy sector and energy security

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ARTICLE INFO

Keywords:
Foreign direct investment
Energy investment
Investment screening
National security
Energy security

ABSTRACT

The global flows of foreign investment are increasingly curtailed by tightening investment screening policies. Several states, including Australia, Germany, Japan and the United States, have recently updated their investment screening legislation to cover new industries, transactions and buyers in order to protect sectors deemed sensitive to national or public security. In this article, we analyze the implications of the evolving investment screening landscape for the energy sector. Based on the comparative appraisal of regulatory and administrative developments primarily in the United States and the European Union, we identify the most significant policy changes and their likely outcomes for the energy sector. By analyzing law, policy and individual screening decisions, we demonstrate how investment screening increasingly encroaches on new segments of the energy value chain and poses new challenges for international energy investments. Most importantly, the changing investment screening practices are likely to affect cross-border transactions in energy infrastructures, energy technologies and data-intensive technologies, including the digitalization of the energy sector and concerns over the protection of personal data. We further suggest that the new types of security issues addressed in investment screening legislation and policy push the boundaries of the traditional notions of energy security.

1. Introduction

1.1. Background and research objective

The global flows of foreign direct investment (FDI) are increasingly curtailed by tightening investment screening policies. In a marked departure from the liberalization of global capital markets that characterized much of the late 20th and early 21st century, governments across the world are growing more hesitant to allow the sale of domestic companies to foreign investors in sectors deemed sensitive to national and public security. In 2018 alone, cross-border transactions representing over 11% of total global FDI failed due to security-based government intervention (UNCTAD, 2019a). While screening foreign investments on national security grounds is not new, the reach of national security reviews has greatly expanded over the 2010s to cover new industries, transactions and buyers. It is no secret that such regulatory developments in the advanced economies, including Australia, Japan, the United States and the European Union, are a direct response to the fast growth of Chinese cross-border mergers and acquisitions (M&A) and other forms of FDI (Hanemann et al., 2019). Accordingly, the changes in national investment screening policy both reflect the tensions in international economic relations and augment its other expressions such as tariffs, export controls and industrial policy (Roberts et al., 2019).

The developments in investment screening legislation and policy have important implications for the energy sector. Even though exploration, production and supply of energy, as well as the protection of energy infrastructures, have been covered by numerous investment, ownership or licensing restrictions in the past (Dralle, 2018), the recent regulatory changes extend the reach of cross-sectoral investment screening mechanisms to new segments of the energy value chain. Government oversight increasingly covers not just the development of new energy technologies but also the application of new sets of technologies to the energy sector as well as ensuing data protection issues. In addition, the established definitions of the key concepts in investment screening, such as ‘critical infrastructure’, are being extended to cover the digitalization of energy supply, thus increasing the competence of the screening authorities and posing novel risks for energy companies. The tightening investment screening legislation is backed by a more assertive government intervention policy. Australia, Canada, Germany and the United...
States, among others, have already prohibited various foreign acquisitions in domestic companies operating energy grids, gas transmission facilities, solar and wind power production and battery development since 2018.

This article analyzes the recent changes in investment screening legislation and policy from the perspective of the energy sector. The article has two aims. First, it traces the regulatory and administrative developments in key jurisdictions, primarily the United States (US) and the European Union (EU), and identifies the likely future trajectories and outcomes of investment screening practices for the energy sector. We submit that, going forward, the evolving investment screening landscape is likely to affect international transactions particularly in energy infrastructures, energy technologies and in the application of data-driven technologies to the energy sector. The article’s second aim is to connect the evolving practices of investment screening with the changing notions of energy security. We suggest that the growing emphasis on new types of security issues and risks detected in investment screening legislation and policy, including the digitalization of the energy sector and the concerns over the protection of personal data, push the boundaries of the traditional energy security framing. While the available data is still too limited for definitive conclusions, the experience with energy transactions in the developing investment screening systems indicates more constitutive changes for conceptualizing energy security, and with that, national or public security in the future.

1.2. Data and methodology

Our research is based on a comparative analysis of investment screening legislation and policy in different jurisdictions over the 2010s. We analyze the regulatory changes in two representative legal systems, the US and the EU, and draw further examples of screening legislation and policy from other jurisdictions such as Australia, Germany and Japan. We augment the comparative legal appraisal by collecting and analyzing investment screening decisions by the national authorities in the energy sector.

Even though the tightening of investment screening legislation and policy is clearly a global trend (OECD, 2019a; UNCTAD, 2019a), the focus on the US and the EU is justified for two reasons. First, they are central targets for the global FDI that have, historically, maintained an open investment climate. Accordingly, the imposition of new regulatory hurdles for FDI in the US and the EU exemplifies profound shifts in the ‘securitization’ of economic policy (Roberts et al., 2019). Second, regardless of their contemporary convergence, the legal orders of the US and the EU are beset with intriguing differences and similarities in their investment screening institutions and legislation. While the US has a long history with cross-sectoral investment screening, the EU’s investment screening framework only came into force in April 2019 and will apply to member states from October 2020. This notwithstanding, the US member states have a long tradition in devising capital controls to foreign investment particularly in the energy sector (Anwar, 2012). For this reason, the EU’s judicial system has already produced a robust body of case law on the relationship between public security and energy investments. Juxtaposing this case law with the more recent practice by national investment screening institutions underlines the profound changes in conceptualizing energy security and its influence on foreign investment over the 2010s and going forward.

Our analysis is confined to the investment screening mechanisms. While the developments related to sectoral legislation, such as ownership restrictions, legislated state monopolies and various licensing schemes prevalent in the energy sector, are occasionally discussed, the article focuses on the interactions between the cross-sectoral investment screening mechanisms and the energy sector. This underscores the significance in the development of general investment screening frameworks for sectors that have historically been regulated by the sector or the industry specific legislation (Commission, 2018b).

The main research data comprise of legislation, policy documents, case law and investment screening decisions by national authorities. The research materials have been collected primarily from official sources which, in addition to legislation and policy documents, include e.g. reports by the investment screening institutions. The research also uses existing literature on investment screening law (Clark and Ware, 2010; Heinemann, 2012; Heifetz and Gershberg, 2013; Bungenberg and Hazarika, 2019), energy and investment law (Cameron, 2010; Talus, 2013; Duan et al., 2018), international relations (Amin and Guan, 2012; Otero-Iglesias and Weissneegger, 2019; Goldthau et al., 2019) and energy policy (Conrad and Kostka, 2017; Reins, 2019).

Despite this varied body of scholarship, the relationship between investment screening and energy policy remains undertheorized. Our analysis seeks to fill the apparent research gap by identifying and analyzing the legislative and administrative choices pursued in investment screening in different jurisdictions. Due to the variance in national legislation and its broader legal context, the article is focused on the major changes in the competence of national investment screening mechanisms as well as their evolving practice. In order to make the discussion accessible to non-legal audience, the analysis is accompanied by three tables that highlight the key changes in legislation as well as organize the existing screening decisions and case law with reference to the potential security concerns in the energy sector.

The data analyzed in this article should be approached with some caution. Most notably, the access to concrete investment screening decisions is highly restricted, which leads to incomplete data and thus limits the conclusions that can be drawn. In most cases, the decisions by national investment screening mechanisms are not public. This applies to the content of the decisions, the procedure, standards of review and overall information about a pending or concluded security review (Wehrle and Pohl, 2016). In the legal literature, the operation of investment screening mechanisms is regularly referred to as the ‘national security black hole’ (Li, 2017). While there is detailed information available on the most high-profile decisions, more commonly the details on the transaction’s security implications must be collected from various sources that include the disclosures by the parties due to their reporting obligations, the aggregate reports by the investment screening institutions, industry sources and the financial press. It should be noted that these sources are not mutually comparable and usually do not shed conclusive light on the dynamics of a failed transaction. In other words, the data does not always explain whether a transaction was withdrawn from the screening process because it failed to meet the conditions of the government or because the withdrawal was informed by other financial reasons. Relatedly, no reliable international statistics on the prevalence of investment screening practice currently exist (UNCTAD, 2019a). These limits notwithstanding, the available data allows us to identify the main trajectories of investment screening policy and assess its implications on the energy sector.

The article is structured as follows. Section 2 introduces the functions and operation of national investment screening mechanisms and analyzes their changing legal and policy context in the United States and the European Union. Section 3 explores the treatment of energy in key national investment screening mechanisms, with a focus on the impacts that the expanding notions of critical infrastructures and critical technologies have on the energy sector and energy security. Section 4 further analyzes the recent emergence of protection of software and data in investment screening legislation and policy, suggesting that they are likely to have significant impacts both on the data-driven energy transition and the overall understanding of energy security. Section 4 concludes and summarizes the policy implications of the evolving investment screening landscape for energy companies and governments.
2. Investment screening: operation and policy context

2.1. Rationale, operation and the changing policy context of investment screening

Screening foreign investments on national security grounds is not new. On the contrary, various mechanisms for controlling the sale of domestic companies to foreigners in sensitive sectors have been used throughout the 20th century (Kudrlic, 1993; Sauvant, 2009). The coverage, typical usage and overall desirability of foreign investment screening have, however, varied over time. Early on, investment screening mechanisms targeted primarily industries that were intimately tied with national defense, such the development and production of military equipment. Additionally, investment screening was used as covert protectionism where governments protected their key industries, national champions or technological supremacy from foreign acquisitions (Alvarez, 1989; Lenihan, 2018). Towards the end of 20th century, the liberalization of the global economy severely limited states’ ability and willingness to control cross-border investment, thus turning investment screening into an exceptional administrative process that mostly covered critical industries and societal functions, such as energy supply (Anwar, 2012; Lenihan, 2018). Despite the policy changes, cross-sectoral investment screening mechanisms have persisted as a backstop through which significant security interests embedded in private transactions can be protected (Heinemann, 2012). In fact, these mechanisms have become more significant and assertive over the past decade (UNCTAD, 2019b; OECD, 2019b).

The contemporary investment screening mechanisms come in many shapes and sizes. While there is no such thing as a typical screening mechanism, they share several key characteristics regarding their legal basis, coverage and intervention powers. Most screening mechanisms are constituted through standalone legal frameworks that enable governments to intervene in cross-border transactions, such as M&A or greenfield investments, on limited grounds for protecting national, essential or public security or interest (Wehrlé and Pohl, 2016, 29–31; UNCTAD, 2019a, 9–10). Alternatively, investment screening may be a part of the general competition law regime, as is currently the case in the United Kingdom, or sectoral legislation, as is the case in the Netherlands where acquiring ownership in gas and electricity infrastructure may require prior authorization (Fraedrich et al., 2018; Commission, 2018b).

In practice, the operation of the investment screening mechanism is usually based on either mandatory or voluntary notices submitted to a government body – usually a ministry – by the parties to the transaction. If a transaction is considered to include security concerns, most national systems allow the government to prohibit the transaction or to impose special conditions, such as forced divestitures or additional security arrangements, on the deal (Wehrlé and Pohl, 2016; Lenihan, 2018).

The scope of national screening mechanisms varies on sectoral, personal and geographical basis. Some governments screen foreign investments only in certain sectors such as real estate, telecommunications or energy infrastructure (Wehrlé and Pohl, 2016, 12–13). Overall, however, cross-sectoral screening mechanisms have become more prevalent, even if the sectoral legislation continues to augment its reach in certain policy areas (Fraedrich et al., 2018). The personal scope of investment screening mechanisms is similarly mixed, and foreign investors are often riddled with multiple application or intervention thresholds depending on their nationality and ownership structure (Wehrlé and Pohl, 2016, 24–27). Most screening mechanisms are triggered when an investment exceeding certain financial thresholds is proposed or completed, but the legislation often allows for retroactive intervention if the parties have failed to file the application. Frequently, the intervention threshold is based on acquiring a certain percentage, such as 10%, 25% or 50%, of the target company’s shares (UNCTAD, 2019a, 10–11). In a recent legislative change, Japan lowered the intervention threshold from 10% to 1% of shares if the target company was publicly listed (MOF, 2019). Alternatively, the intervention threshold may be defined using the absolute amount of investment, as in the UK where investments exceeding as little as £1 million are covered after the most recent amendments. Functional definitions, such as the US system that hinges on acquiring ‘control’ over the target company, are also used (UNCTAD, 2019a, 10–11).

The nationality of a foreign investor is a key determining factor in many national systems (OECD, 2019a, 19–20). In most EU member states, for example, the cross-sectoral screening mechanism only targets non-EU investors, but many governments retain the right to intervene even in intra-EU transactions in certain sectors, such as defense. More recently, Australian, Canadian and the US screening mechanisms, among others, have been explicitly targeting Chinese investors, and state-owned companies in particular (Wehrlé and Pohl, 2016). This is a significant development because investment screening has, in the past, been considered as a tool for economic and political balancing particularly within the same security community, such as in transactions between companies from two NATO or EU member states (Lenihan, 2018). By contrast, the increased scrutiny on Chinese investors signals the increasing reliance on national investment screening mechanisms in strategic geopolitical or geoeconomic competition (Roberts et al., 2019; Otero-Iglesias and Weissenegger, 2019).

Crucially, the reach of investment screening mechanisms has extended in recent years (Fraedrich et al., 2018). This is due to two key developments: the increasing number of states that host a dedicated investment screening system, and their expanding competence. Since 2011, 13 states have introduced new regulatory frameworks for dedicated national security-related screening mechanisms, bringing the total to 28 national screening systems, located mostly in advanced and emerging economies. In addition, 15 states have made significant amendments to their existing screening systems, and several others, such as the UK, are currently overhauling their investment screening legislation in an effort to modernize (UNCTAD, 2019a). The growing geographical coverage of investment screening mechanisms is augmented with expanding their competence to cover new sectors and investors as well as making the penalties for transgressions more severe (OECD, 2019a). As a result, a growing share of global transactions are negatively affected by national screening mechanisms. In 2018 alone, 11.6% of total global foreign direct investment (approximately $150 billion) failed due to government intervention in national security review (UNCTAD, 2019a). The indirect financial impacts are, however, likely much greater than the above estimate suggests, mostly because it is hard to isolate the chilling effect of investment screening legislation on the general willingness to initiate cross-border investment and transactions (Frattaroli, 2019). It should also be noted that the available data is incomplete, mostly due to poor reporting by national investment screening authorities, but also due to the reluctance of private companies to publicize their failure to pass the national security review (Westbrook, 2019).

2.2. The expansion of investment screening in the US and the EU

Recent law and policy changes in the US and the EU exemplify the state-of-the-art and illustrate the future trajectories of investment screening (Jacobs, 2019). The US currently hosts the most sophisticated system for national security review. Since the late 1980s, the legislation has authorized the president to suspend or prohibit any transaction that threatens to impair the US national security. The Committee on Foreign Investment in the United States (CFIUS), an interagency body, is

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1. The Enterprise Act 2002 (Turnover Test) (Amendment) Order 2018, https://www.legislation.gov.uk/uksi/2018/593/made?view=plain (last accessed 18 February 2020).

2. Codified in the 50 U.S. Code § 4565, https://www.govinfo.gov/content/pkg/USCOURT-2015-title50/html/USC005-2015-title50-chap55-subchapII-sec4565.htm (last accessed 18 February 2020).
responsible for analyzing and screening the transactions. The US system has been overhauled twice over the past decade and a half, first by the Foreign Investment and National Security Act of 2007 (FINSA) and then by the Foreign Investment Risk Review Modernization Act of 2018 (FIRRMA) (see Table 1). The Acts are supported with detailed regulations by the Department of the Treasury, latest of which were released on January 17, 2020.\(^3\)

The FIRRMA is a prime illustration of the growing personal and material scope in investment screening. Previously, the legislation only covered transactions where the control of a US business would be transferred to a foreign person, either through acquiring over 50% of the voting rights or through other means. By contrast, the FIRRMA authorized the CFIUS to review non-passive minority transactions if the target company operated with critical technologies, critical infrastructure or sensitive personal data, thus lowering the intervention threshold substantially in these sectors. Additionally, certain real estate deals were added to the government’s screening powers. Moreover, the FIRRMA widened the definitions of critical technologies and critical infrastructure, which were primarily limited to defense technology and energy assets in the previous system. In the FIRRMA, the reach of investment screening extends to ‘emerging and foundational’ technologies, defined in conjunction to a refined export control legislation, which cover, among others, artificial intelligence (AI), quantum computing, robotics and blockchain technologies. Cumulatively, the changes in the FIRRMA substantially expand the jurisdiction of the CFIUS to review even minor transactions in key sectors (Friedrich et al., 2019). To a great extent, the legislative changes reflect the tightening investment screening policy and the growing number of the CFIUS interventions over the past decade (CFIUS, 2019).

The changes in the European investment screening landscape mirror those of the US. Roughly half of the EU member states have maintained an investment screening system in the 2010s, and several governments have introduced a screening system for the first time over the past years (Commission, 2019a). The practice of the national screening mechanisms is likely converge in the future because of the introduction of the Regulation establishing a framework for the screening of foreign direct investments (FDI Regulation),\(^4\) which will be applicable to member states starting October 2020. Essentially, the FDI Regulation establishes a framework within which the European Commission and member states can share information and coordinate responses to a broad range of FDI, including M&A and greenfield investments where foreign investors seek to establish new or expand existing businesses in the home state’s jurisdiction (Reins, 2019). The competence to intervene in a transaction continues to rest with national governments (see Table 1) (De Kok, 2019).

The FDI Regulation reflects the trend for expanding the material and personal scope of investment screening. This is evidenced by its wide and non-exhaustive set of factors that may be taken into consideration when determining whether FDI is likely to affect security or public order. In addition to critical infrastructures and dual-use technologies, the FDI Regulation explicitly mentions the development key civil technologies such as AI, robotics and quantum, nuclear and biotechnologies as well access to sensitive information, including personal data.\(^5\) The characteristics of the foreign investors are similarly taken into account. Most notably, the security determination can be informed by the fact that the foreign investor is directly or indirectly controlled by the government of a non-EU country, including through ownership structure or significant funding.\(^6\) This provision is widely considered as a direct response to the heightened investment activity by Chinese state-owned or state-linked companies in Europe, but it also covers the investments by Russian entities particularly in the energy sector where additional investment protections have been in effect for over a decade\(^7\) (Hane-mann et al., 2019).

When combined with the introduction of new national investment screening mechanisms in Europe (e.g. in Hungary) (Commission, 2019a), the numerous amendments that expand the competence of existing mechanisms (e.g. in France, Germany and Italy) and the forthcoming updates (e.g. in Finland), the legislative and policy developments in the EU clearly signal and reinforce similar trends that were identified in the US investment screening practice (OECD, 2019a; Jacobs, 2019).

3. Investment screening in the energy sector

3.1. The relevance of investment screening to energy

The changes in the investment screening legislation and policy are crucial for the energy sector. Energy has been a mainstay in investment screening at least since the 1970s. Governments have used methods such as state ownership, ownership restrictions and national security screening to bar foreign persons from acquiring energy production, storage and distribution facilities, including strategic oil refineries and energy grids (Kudrle, 1993; Commission, 2018b). Similarly, most contemporary screening mechanisms already cover energy as a priority area (Wehrle and Pohl, 2016).

While the parties to cross-border energy transactions already routinely include the completion of national security review as an important condition in transaction agreements,\(^8\) the extending competence of national screening mechanisms pose novel obstacles for cross-border energy investments and the energy sector. In particular, the expanding definitions of ‘critical infrastructures’ and ‘critical technologies’, in addition to the increasing focus on data and data-driven technologies, change the scale and scope of security implications addressed through cross-sectoral investment screening. These developments can already be discerned in the practice of national investment screening mechanism where energy investments have been either prohibited or subjected to mitigation measures (see Table 2).

The developments in national investment screening mechanisms also affect our understanding of energy security as a part of wider public or national security concerns. The traditional focal points of energy security such as the availability of primary energy sources or the pursuit of energy independence have been in effect for over a decade (Hane-mann et al., 2019).

\(^3\) 31 CFR Parts 800 and 801, Provisions Pertaining to Certain Investments in the United States by Foreign Persons, https://home.treasury.gov/system/files/206/Part-800-Final-Rule-Jan-17-2020.pdf (last accessed 18 February 2020).

\(^4\) Regulation (EU) 2019/452 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/44/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and amending Directive 2003/55/EC Article 11 of Directive (2009)/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and amending Directive 2012/27/EU. Similar mechanisms to safeguard energy security were adopted through Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 944/2010, OJ L 280, 28.10.2017, p. 1–56 and Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC, OJ L 158, 14.6.2019, p. 1–21.

\(^5\) Article 11 of Directive (2009)/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC and Article 53 of Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU. Similar mechanisms to safeguard energy security were adopted through Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 944/2010, OJ L 280, 28.10.2017, p. 1–56 and Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC, OJ L 158, 14.6.2019, p. 1–21.

\(^6\) For a recent example, see e.g. the conditions on regulatory approvals required for the merger in a proposed acquisition of Pattern Energy Group, a renewable energy company, by Pacific US Inc, a company controlled by Canada Pension Plan Investment Board (4 February 2020), https://www.sec.gov/Arch ives/edgar/data/1561660/000119312520002456/d816812dd3f14a.htm (last accessed 18 February 2020).
energy independence are increasingly augmented with the protection of energy technology development capabilities, including in renewables, as well as fears over wrongful use of big data. Accordingly, the changes in investment screening law and policy may spearhead more constituent changes for conceptualizing energy security, and with that, national or public security in the future.

To demonstrate how the evolving investment screening landscape affects the traditional notions of security in the energy sector, we continue the analysis in two parts. First, we explain the role of investment screening in the security discourse from the perspective of the energy sector. We then analyze the relationship between energy and investment screening in the identified security landscape by isolating three distinct areas of investment screening in the energy sector: critical infrastructures, critical energy technologies and data-driven technologies.

### 3.2. Investment screening in the security discourse

Energy security is a concept that often escapes definition attempts, but it is commonly understood as the uninterrupted availability of affordable energy (Sovacool, 2011, 3-6). Investment screening in the energy sector has significant security implications, which concern national security or public security generally but also energy security as an element of national security (Commission, 2018b).

In the past, traditional notions of energy security have mostly focused on issues such as decreasing dependence on other states and guaranteeing the availability of primary energy sources. For a long time, states controlled practically all energy investment for the simple reason that they were the primary actors in the energy markets. States decided when, where and what investments were needed. They also owned and operated the energy facilities once the investments had been made (Tornelli, 2000; Wolf, 2009; Tordo et al., 2011). State-owned energy companies continue to be the norm in most states even though the global trend of market liberalization as decreased the role of the state as the incumbent (Haney and Pollitt, 2013). In this context, the notions of security and energy security were strongly linked to ‘hard’ national security framing and the protection of state sovereignty in the realist tradition of international relations (Nye, 1982; Stoddard, 2013). While ensuring the uninterrupted availability of affordable energy is still a core objective of energy security, the evolving economic, technological and societal landscape modifies and broadens the measures through which this objective is pursued.

For instance, the security issues that arise in the context of the energy transition deal with addressing the increasing intermittence of energy generation (Huhta, 2020) and, in the longer-term, with ensuring the physical security of energy systems in extreme weather and changing climate conditions (IEA, 2019, 67). The global trends of energy market liberalization generally and the internationalization of energy markets specifically have also shifted the focal points of energy security. Energy markets have been gradually opened to regional and international trade and investment. This, in turn, has created new demands for filtering and screening the potential security risks and threats involved in investments, thus intertwining investment screening and energy security intimately with one another.

In these conditions, the national security issues addressed through the FDI screening regimes increasingly leak additional components into the energy security discourse and alter the scope of what is understood as included in energy security. This development is particularly pertinent due to the development of new technologies and the application of these technologies to the energy sector, which are both increasingly registered in the energy security discourse (IEA, 2019, 68) and caught by investment screening mechanisms.

In practice, the security implications of investments screening in the energy sector can be mutually conflicting. On the one hand, investment screening mechanisms can be used to ensure energy security by restricting the transfer of control of strategic energy assets to parties that are considered a risk (Goldthau and Sitter, 2014). On the other hand, security implications of investment screening in the energy sector be can, and often also are, understood more broadly to encompass not only energy security, but also national or public security (Commission, 2018b). In this context, it is possible that a prohibitive investment screening decision is made which improves national security but may, for example, weaken some elements of the availability of affordable energy. Such a tension can be identified in existing investment screening practice such as in the case of Ralls/Terna Energy, where an investment into new generation capacity by a Chinese company was prohibited due to
the proximity of the project to military installations (Zucker and Hari, 2014) as well as in CNOOC/Nexen and Dragon Gem/PEDEVCO transactions (see Table 2). In other words, the notion of security entails not only energy security per se but also other security issues that relate to the energy sector in the context of investment screening. Addressing these energy-related security issues is vital due to importance of a functioning energy sector to any state.

### Table 2

Recent national investment screening decisions in the energy sector.

| Segment of the energy sector | Energy infrastructure |
|------------------------------|-----------------------|
| **Transaction (target-buyer)** | **Jurisdiction, Year** | **Industry** | **Security concern** | **Outcome** |
| First State SP (Italy) - Uniper Global Commodities SE (Germany) | Italy, 2019 | Gas generation and distribution | Preservation of the infrastructure’s strategic role, maintenance of a specific regasification plant | Transaction cleared with mitigation measures |
| APA Group (Australia) - CK Asset Holdings Ltd (China, Hong Kong) | Australia, 2018 | Gas transmission | Long-term national interest implications of a dominant foreign operator in the gas and electricity sectors | Transaction prohibited by the federal government |
| 50 Hz (Germany) - State Grid (China) | Germany, 2018 | Energy grid | National security | Transaction withdrawn after the federal government acquired the major position in the target company through state development fund |
| Ausgrid (Australia) - State Grid (China) | Australia, 2016 | Energy grid | National security | Transaction prohibited by the federal government |
| Eandis (Belgium) - State Grid (China) | Belgium, 2016 | Energy grid | Security of technology, energy supply and customer data | Transaction refused by the city of Antwerp, a major shareholder in the target company |

| Segment of the energy sector | Energy production and supply |
|------------------------------|-----------------------------|
| **Transaction (target-buyer)** | **Jurisdiction, Year** | **Industry** | **Security concern** | **Outcome** |
| Aecon Group (Canada) - China Communications Construction Company International (China) | Canada, 2018 | Construction, nuclear energy | National security | Transaction prohibited by the federal government |
| Recurrent Energy (US, Canada) - Shenzen Energy (China) | US, 2018 | Solar power | Unspecified | Transaction withdrawn due to apparent CFIUS opposition |
| PEDEVCO Corp. (US) - Dragon Gem Limited and Absolute Frontier Limited (China, Hong Kong) | US, 2017 | Oil and gas development | Unspecified | Transaction withdrawn due to apparent CFIUS opposition |
| Hinkley Point C nuclear power station, greenfield joint venture by EDF (France) and CGN (China) | UK, 2016 | Nuclear energy | National security | Transaction cleared with mitigation measures |
| Nexen (Canada) - CNOOC (China) | US, 2013 | Oil and gas development | Proximity to military installations | Transaction cleared with mitigation measures |
| Terna Energy USA Holding Corporation (US) - Ralls Corp (China) | US, 2012 | Wind farm | Proximity to military installations | Transaction prohibited; the action later challenged in court and the case settled |

| Segment of the energy sector | Technology development |
|------------------------------|------------------------|
| **Transaction (target-buyer)** | **Jurisdiction, Year** | **Industry** | **Security concern** | **Outcome** |
| Navitas Systems (US) – Voltabox (Germany) | US, 2018 | Battery technology | Unspecified | Transaction withdrawn due to apparent CFIUS opposition |
| Leifeld Metal Spinning (Germany) – Yantaai Tailai (China) | Germany, 2018 | Construction, commercial nuclear energy | National security | Transaction withdrawn, then prohibited by the federal government |
| Evatran Group (US) - Zhejiang Vie Science & Technology Co (China) | US, 2018 | Wireless electric vehicle charging technology | Unspecified | Transaction withdrawn due to CFIUS opposition |
| Maxwell Technologies (US) - SDIC Fund Management (China) | US, 2018 | Battery development | Unspecified | Transaction withdrawn due to CFIUS opposition |
| Lumileds (Philips, Netherlands) - GO Scale Capital et al. (China) | US, 2016 | Lighting, semiconductors | Semiconductor technology, raw materials | Transaction cleared with mitigation measures |
| A123 Systems Inc (US) - Wanxiang Group (China) | US, 2013 | Technology transfer | | Energy security |

**Note:** The table provides a sample of recent national investment screening decisions in the energy sector, highlighting the various factors and outcomes involved in such decisions.
3.3. Energy and critical infrastructures

Historically, energy has featured prominently in government interventions to cross-border transactions in order to ensure the security of critical infrastructures (Kudrle, 1993; Lenihan, 2018). In practice, the concrete restrictions on energy investments have been informed by attempts to guarantee the availability of and access to national petroleum products, the affordability of energy to final consumers as well as to preserve the ownership of and control over strategic energy companies in national hands. While states are well within their rights to introduce investment impediments, such as ownership restrictions or licensing schemes, to realize these goals, the liberalization of the energy sector through bilateral, regional or multilateral trade and investment treaties has narrowed the governments’ policy space and set limits for blocking cross-border investments on security grounds (Sauvant, 2009). Due to wide security exceptions integrated into these international instruments, however, governments retain a wide margin of appreciation particularly in the case of energy security (Huhia, 2019a, 145-66). Regardless, the legality of ownership restrictions has been tested both on national, regional and international forums. A particularly extensive judicial practice has emerged in the EU, where the case law by the Court of Justice of the European Union (CJEU) spanning from the early 1980s to present day has sought to balance the governments’ claims for preserving public security with the market operators’ arguments based on the free movement of capital. While these cases tackle the measures governments have taken to protect against foreign influence in the energy sector, the types of restrictions, security issues and outcomes that arise from the CJEU’s case law provide important historical context for the contemporary investment screening decisions that focus on individual transactions (see Table 3). Most importantly, the regulatory attempts in relation to security of energy production, transmission and supply clearly remain key factors also in the modern investment screening policy. At the same time, however, the CJEU’s most recent cases, such as Tempus Energy, suggest that the impact of new technologies on energy may also inform novel investment restrictions.

In recent years, the traditional focus of investment screening mechanisms on energy production, transmission and supply has been augmented in novel ways. Perhaps the most significant change has been the evolving definition of ‘critical infrastructure’. In the US, ‘critical infrastructure’, understood as physical or virtual systems and assets so vital that their incapacity or destruction would have a debilitating impact on national security, was introduced to the investment screening legislation with the FINSA package in 2007. At the time, ‘major energy assets’ were the only concrete example through which the concept was expanded or defined (Zive, 2013). When the FIRMMA was passed in 2018, the definition was specified, and the types of covered energy infrastructures were listed to include, among others, electric generation and transmission assets, oil refineries, certain pipelines and terminals for liquefied natural gas. In the EU, the FDI Regulation similarly includes energy infrastructures, as well as land and real estate crucial for their use, as critical infrastructures. In addition to the specified energy infrastructures and real estate, both the FIRMMA and the FDI Regulation cover raw materials critical for e.g. renewable energy development and the supply of critical inputs, including energy, as distinct factors to consider when making screening decisions.10

Changes in legislation respond to, and are informed by, the treatment of energy investments in investment screening practice. Over the past five years, a range of cross-border energy transactions have been targeted because of their links to critical infrastructure (see Table 2). In practice, governments have intervened particularly in foreign investments into gas (Australia, Italy) and electricity (Australia, Germany, Belgium) distribution infrastructure. While Chinese investors are over-represented in this category, the investment screening practice also includes transactions between companies based in developed economies as was the case in the Italian Uniper/First State review. In addition to energy infrastructures such as grids, intervention into critical energy production infrastructures, such as nuclear energy companies, have been staples in contemporary national security reviews. In the UK, for instance, the construction of Hinkley Point C nuclear power plant by an international joint venture, including French and Chinese state-owned companies, prompted security analysis and mitigation measures despite being a greenfield investment (Roberts, 2018). Similarly, Canada and Germany have prohibited the sale of construction companies operating in the nuclear sector to Chinese investors, whereas the US national security review has led multiple oil and gas transactions to fail through. In addition to traditional energy sources, there is also a clear tendency towards the inclusion of renewable energy production in national investment screening policy. In the US, the acquisition of wind farms by a Chinese investor was prohibited, but the case was subsequently challenged and settled out of court (Zucker and Hari, 2014). Going forward, it is likely that the expanding notions of ‘critical infrastructure’ will further aggravate investment screening policy regarding production, transmission and supply of energy. Significant regional differences may, however, remain (Pareja-Alcaraz, 2017; Otero-iglesias and Weissenegger, 2019).

Further interactions between energy and ‘critical infrastructure’ are also possible. In particular, the ‘digital’ or ‘virtual’ dimensions of critical infrastructure, as covered by both the US and the EU investment screening legislation, are likely to extend to the energy sector. In Germany, for instance, the new investment screening legislation already covers the software used in the operation of critical infrastructures such as energy grids.11 While the concepts such as the ‘digital critical infrastructure’ often refer to the security of key information nodes and networks, such as the operation of the fifth generation (5G) mobile networks (Botton and Lee-makiyama 2018), the growing use of big data in critical sectors such as energy have already been identified as an important security risk (Commission, 2019; IEA, 2019). Thus, the range of issues dealt with under the concept of digital critical infrastructure will likely expand to cover transactions in technologies that previously had no or little relevance in the energy sector.

3.4. Energy and critical technologies

Much like energy production and infrastructure, the protection of technology development capabilities has long been covered by national investment screening mechanisms. The overhaul of the CFIUS system in the US in the late 1980s, for instance, was largely motivated by concerns over technology transfer through a series of high-profiﬁc acquisitions of US technology companies by Japanese investors (Alvarez, 1989). Currently, national screening mechanisms both in the US and the EU, along e.g. with Japan and South Korea, are increasingly indicating a return to policies emphasizing technological competition particularly in advanced technologies that have both military and industrial uses (Wu, 2018; Mori, 2019).

While the new legislation has not yet been applied either in the US or the EU, two distinct trends can already be identiﬁed in the screening practice. Outside the energy sector, the most high-proﬁle screening decisions have involved various technology companies. In 2017, the acquisition of Lattice Semiconductor by a US-based company reportedly funded by the Chinese government was blocked by the president

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9 31 CFR Parts 800 and 801, Provisions Pertaining to Certain Investments in the United States by Foreign Persons, Appendix A to Part 800—Covered Investment Critical Infrastructure and Functions Related to Covered, https://home.treasury.gov/system/files/206/Part-800-Final-Rule-Jan-17-2020.pdf (last accessed 18 February 2020).
10 FDI Regulation, Article 4.
11 Außenwirtschaftsverordnung § 55, http://www.gesetze-im-internet.de/aww_2013/index.html (last accessed 18 February 2020).
following the recommendation by the CFIUS. In 2018, the sale of chip maker Qualcomm to Broadcom, a Singapore company, was similarly denied. In addition to the semiconductor industry, the US security reviews have concentrated on information technology, financial technology and pharmaceuticals (Zimmerman, 2019). The growing focus on security reviews increasingly touch on commercial energy technology, especially battery technology development. The US, in particular, has prohibited from acquiring companies developing technologies in renewables. The recent changes in legislation, including the wide-ranging technology listings, such as nuclear power, solar panel semiconductors and wind turbines, as well the inclusion of raw materials critical to power development both in the US and the EU, are moreover likely to intensify the potential risks in foreign investment screening for energy transactions. Similarly, the inclusion of greenfield investments in the coverage of the FDI Regulation may bring about more extensive scrutiny, given that it is the most prevalent form Chinese investments in solar and wind sectors in Europe (Curran et al., 2017).

| Segment of the energy sector | Energy production | Technology development |
|-----------------------------|-------------------|-----------------------|
| Transaction (target-buyer)  |                   |                       |
| Jurisdiction, Year          |                   |                       |
| Industry                    |                   |                       |
| Security concern            |                   |                       |
| Outcome                     |                   |                       |

| Transaction (target-buyer) | Industry | Security concern | Outcome |
|---------------------------|----------|-----------------|---------|
| 72/83                     | Oil production | Availability of and access to national | Ireland was granted an exemption from the free movement rules on grounds of public security |
| Campus Oil                | Oil production | to national | petroleum products | The Greek system of limiting the importation of petroleum products on grounds of energy security was declared incompatible with EU free movement rules. |
| Commission v Greece (1990) | Oil production | Obligation to maintain minimum stocks of petroleum products, free movement | The Greek legal system for maintaining emergency stocks of petroleum products was declared incompatible with EU free movement rules. |
| ECR I-4747                | Petroleum products | Preserving the ownership of and control over strategic energy company | The Belgian measure was declared incompatible with EU law on grounds of public security |
| EU & Greece, 1990          | Petroleum and electricity | Preserving the ownership of and control over strategic energy company | The French measure was declared incompatible with EU law |
| EU & Belgium, 2002         | Energy sector | Preserving the ownership of and control over strategic energy company | The Spanish measure was declared incompatible with EU law |
| EU & France, 2002          | Natural gas | Preserving the ownership of and control over strategic energy company | The Italian measure was declared incompatible with EU law |
| EU & Spain, 2003           | Demand-side response technologies | Affordability of energy to final consumers | State intervention on the price for the supply of natural gas in order to ensure affordability of energy to final consumers was declared compatible with EU law. |
| EU & Italy, 2009           | Resource adequacy | The substance of the case relates to how flexibility and demand-side response technologies are allowed to contribute to energy security. | Appeal Case before the Court of Justice C-57/19 P. |
| EU & Italy, 2010           |                       |                       |         |
| EU & UK, 2014             |                       |                       |         |

12 Order Regarding the Proposed Acquisition of Lattice Semiconductor Corporation by China Venture Capital Fund Corporation Limited (13 September 2017), https://www.whitehouse.gov/presidential-actions/order-regarding-proposed-acquisition-lattice-semiconductor-corporation-china-venture-capital-fund-corporation-limited/(last accessed 18 February 2020).

13 Presidential Order Regarding the Proposed Takeover of Qualcomm Incorporated by Broadcom Limited (12 March 2018), https://www.whitehouse.gov/presidential-actions/presidential-order-regarding-proposed-takeover-qualcomm-incorporated-broadcom-limited/(last accessed 18 February 2020).
‘emerging and foundational technologies’ that is set to cover key areas of information and communication technology.14 Similarly, the EU’s FDI Regulation specifically includes ‘key enabling technologies’ such as AI, robotics, semiconductors and cybersecurity.15 Access to personal data has already emerged as a potential impediment to foreign acquisitions particularly in the US, where transactions involving companies operating the gay dating app Grindr, the healthcare app PatientsLikeMe and the social media platform TikTok have been met with extensive scrutiny by the CFUS (Roberts et al., 2019). The trend is not limited to the US and the EU, as the recent Australian policy changes emphasizing the protection of personal data illustrate (Fox and Morley, 2019).

The energy sector and energy security are not immune to these changes (IEA, 2019). Instead, the fast-paced digitalization of the energy sector increasingly enables new business models, such as tailored services to energy users on the basis of smart metering or extensive energy efficiency and optimization measures of entire industrial supply chains through data analytics (Singh and Yassine, 2018). Similarly, the energy transition requires major efforts in energy efficiency which can be leveraged through data optimization, automation and machine learning (Huhta, 2019b). While these new practices may help in achieving energy policy goals on energy efficiency or renewable integration, they rely entirely on the access to and utilization of massive, granular data sets (Zhou and Yang, 2016). Irrespective of the data being industrial or personal, access to it creates new types of potential security concerns (Pearce, 2016; Pagallo, 2017).

Both the US and the EU legislators have integrated sensitive or personal data with investment screening in the most recent legislative amendments. The US FIRRMA explicitly covers ‘sensitive personal information’ that contains identifiable data or that consists of a dataset on 1 million individuals. Similarly, the FDI Regulation identifies access and ability to control sensitive information, including personal data, as a key consideration when conducting the security review. While the new legislation has not yet been applied, interventions in social media platform or financial service provider transactions has already become more prevalent over the past two years (Roberts et al., 2019; Lysenko et al., 2020). So far, energy transactions have not attracted similar attention. According to our analysis there are only two known cases where access to personal data was considered in reviewing a cross-border energy investment. In the first case, the proposed sale of Eandis, a regional grid operator in Belgium, to China’s State Grid was opposed by the city of Antwerp partially due to the protection of customer data (Hope, 2016).

In the second case, the acquisition of Evatran Group, a US company developing wireless electric vehicle charging technology, by Chinese Zhejiang Vie Science & Technology Co failed through. The reasons for this are not public, but industry sources claim that the potential for collecting sensitive information on the users of wireless charging stations was a key factor in the security analysis (Rabaolo, 2018). Even though issues of data protection are yet to penetrate the analysis of energy transactions more fully, the Belgian and the US cases illustrate how access to personal data is increasingly entangled with national security reviews. In addition, the cases reveal how the growing focus on personal data is intensifying with the widening conceptions of critical infrastructure and critical technologies.

The skepticism over the use of data in foreign acquisitions in the energy sector mirrors previous developments in relation to privacy and data protection. New energy technologies such as smart meters and energy-related IoT devices have already spurred considerable discussion on the impacts of energy optimization technologies on the right to privacy both in the US and the EU (McKenna et al., 2012; Naus et al., 2015; Veliz and Grunewald, 2018). The explicit inclusion of personal data brings the privacy issues in the center of investment screening legislation and policy, thus enabling intervention into new segments of cross-border energy transactions and further adding to the regulatory risk faced by energy companies pursuing new business models (Leisen et al., 2019).

The application of data-driven technologies in the energy sector also affects the security discourse. In the context of national security, the utilization of data technologies requires that new types of security threats, such as cyber-attacks, are addressed (IEA, 2019). At the same time, however, the increasing reliance on the emerging and evolving data-driven technologies necessitates massive investments (Commission, 2018a), which may be hindered if investment screening mechanisms deter cross-border FDI in data-intensive energy technologies (Zimmerman, 2019). Furthermore, the functioning of these technologies requires a constant and reliable supply of energy, which grows as the societal reliance on the new technologies increases. Accordingly, the increasing utilization of data-driven technologies has implications also on energy security and not just national security in the energy sector. For this reason, the ongoing changes in investment screening legislation signal, but are also likely to push, the evolution of the traditional security framing in the energy sector.

4. Conclusions and policy implications

This article has analyzed the recent changes in investment screening legislation and policy from the perspective of the energy sector. Even though the tightening investment screening policy is only a single factor in the broader landscape of growing tensions among key players in the world economy, it increasingly affects global energy investments. Even prior to the most recent legislative developments especially in the US and the EU, several energy transactions have been denied in jurisdictions as diverse as Australia, Belgium, Germany, the UK and the US. The changes in law and policy have significant practical implications for energy companies and governments but also for the notions of energy security and national or public security.

For energy companies, the probability of a cross-border transaction being ensnared in national security review has grown significantly over the past decade. The law and policy changes in the US and the EU illustrate the expanding competencies of national authorities to intervene in a transaction, such as a merger or even a greenfield investment. Already, energy transactions must be planned with a view of acquiring necessary security-based regulatory approvals, but the expanding geographical reach and competence poses new challenges for the involved parties. Unlike in the past, when investments into the exploration, production, transmission and supply of energy were the primary segments of the sector with a heightened risk for government intervention on the basis of national or public security, the contemporary investment screening mechanisms involve a more heterogeneous group of companies and activities. After the introduction of the 2018 FIRRMA in the US and the 2019 FDI Regulation in the EU, the expanding notion of critical infrastructure now covers energy assets, operators and functions more comprehensively than before. In addition, new legislation and policy encroaches on new activities in the energy value chain. The most significant changes are the widening definitions of critical technologies and the inclusion of personal data as a new factor in investment screening. Accordingly, companies operating in the development of new energy technologies or pursuing data-driven business models are likely to feature in national security reviews more frequently in the future. More broadly, the increased regulatory red tape, uncertainty about the standards applied in security reviews and the fears of targeted protectionism will necessarily affect the overall investment willingness and propensity. Already, Chinese investments into the US technology sector in particular have shrunk substantially, with the investors citing the FIRRMA amendments as a key deterrent (FT, 2020). While the US has
expanded its investment screening system most drastically, the legislative changes in the EU, its members states and in other developed economies show similar trends. This is significant for the energy sector because energy investments often involve companies operating, developing new technology or collecting user data in multiple jurisdictions. Thus, the risk for an energy transaction triggering security reviews in many countries simultaneously is also heightened.

For governments, the changes in investment screening law and policy mark a recalibration in the relationship between open investment climate and the protection of essential security interests. For the past decades, the reduction of capital controls has been a key prescription in economic and financial policy. Even though cross-border energy investments have been reviewed more carefully than many other types of investment in the past, the contemporary securitization of economic policy in investment screening alters the conditions in which the energy sector operates. On a broader level, the tightening strategic competition between major actors such as the US, the EU and China may have surprising effects for energy and climate policy. The energy transition, for instance, is predicated on new technologies able to harness renewable energy sources and to improve energy efficiency, as well as securing necessary funding and investment for their development. The evolving investment screening policy impinges all these dimensions, and it may have a chilling effect on cross-border energy investments needed to finance the cost of energy transition. There are already signs for a more profound shift in viewing the green industrial policy as a strategic security question, as evidenced by the European Green Deal proposed by the EU (Commission, 2019b). It remains to be seen whether the EU and the member states seek to realize these goals by facilitating cross-border transactions or by creating structural impediments for non-EU investments as indicated in the FDI Regulation. Relatively, investment screening may also indicate a reconfiguration within security communities. In the US, for instance, the final rule for the 2018 FIRRM amendment exempted investors from Australia, Canada and the UK from the most intrusive reviews, whereas the FDI Regulation attempts, by design, to converge the investment screening processes in the EU member states.

Aside from its geopolitical implications, the evolving cross-sectoral investment screening mechanisms may also recalibrate the relationship between energy security and national or public security. In particular, the widening coverage of investment screening is likely to strengthen the relative significance of national security issues in policy areas previously dominated by sector-specific regulation such as energy policy. Traditionally, the notions of energy security have focused on ensuring the availability of primary energy sources or the pursuit of energy independence. Going forward, these rationales are augmented with more constitutive set of risks that include the geopolitics of the energy transition, such as the protection of domestic R&D capabilities in wind and solar power and the access to critical raw materials, as well as the question of data protection (Goldthau et al., 2019). Accordingly, more heterogeneous security risks are likely to seep into energy policy. The blocking of the sale of Leifeld Metal Spinning to Chinese Yantai Taihai by the German government in 2018 is indicative of the new ‘security mindset’ that combines various strands of public security, energy security and R&D capabilities while embedding them in a broader geopolitical context characterized by the dramatic increase in Chinese investments in Europe (Bundesregierung, 2016). The changes in the relative weight of national and energy security are accompanied with new institutional arrangements. In the US, for instance, the growing role of the CFUS in overseeing technology transactions has already been criticized (Zimmerman, 2019). Similarly, the emphasis on the protection of critical infrastructures, critical technologies and data-driven technologies may turn national investment screening mechanism into quasi-energy policy regulators or, at the very least, affect the evaluation of risk factors also regarding energy security.

Energy is a significant driver for global investment and national security. The evolution of investment screening legislation and policy across the world responds to the changes in global energy market, the impending energy transition and the fast-paced development of energy technologies. While energy has always been a geopolitical mainstay, the contemporary legislative developments within cross-sectoral investment screening mechanisms push the earlier energy security paradigms in new directions. Energy transactions, in short, are increasingly embedded in a strategic rivalry over technological development capabilities and data. While the energy sector continues to be regulated through a complex web of sectoral instruments, the growing reach of cross-sectoral investment screening mechanisms illustrates the key regulatory trends for global energy markets for years to come.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This work was supported by the Academy of Finland [grant number 324037].

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