



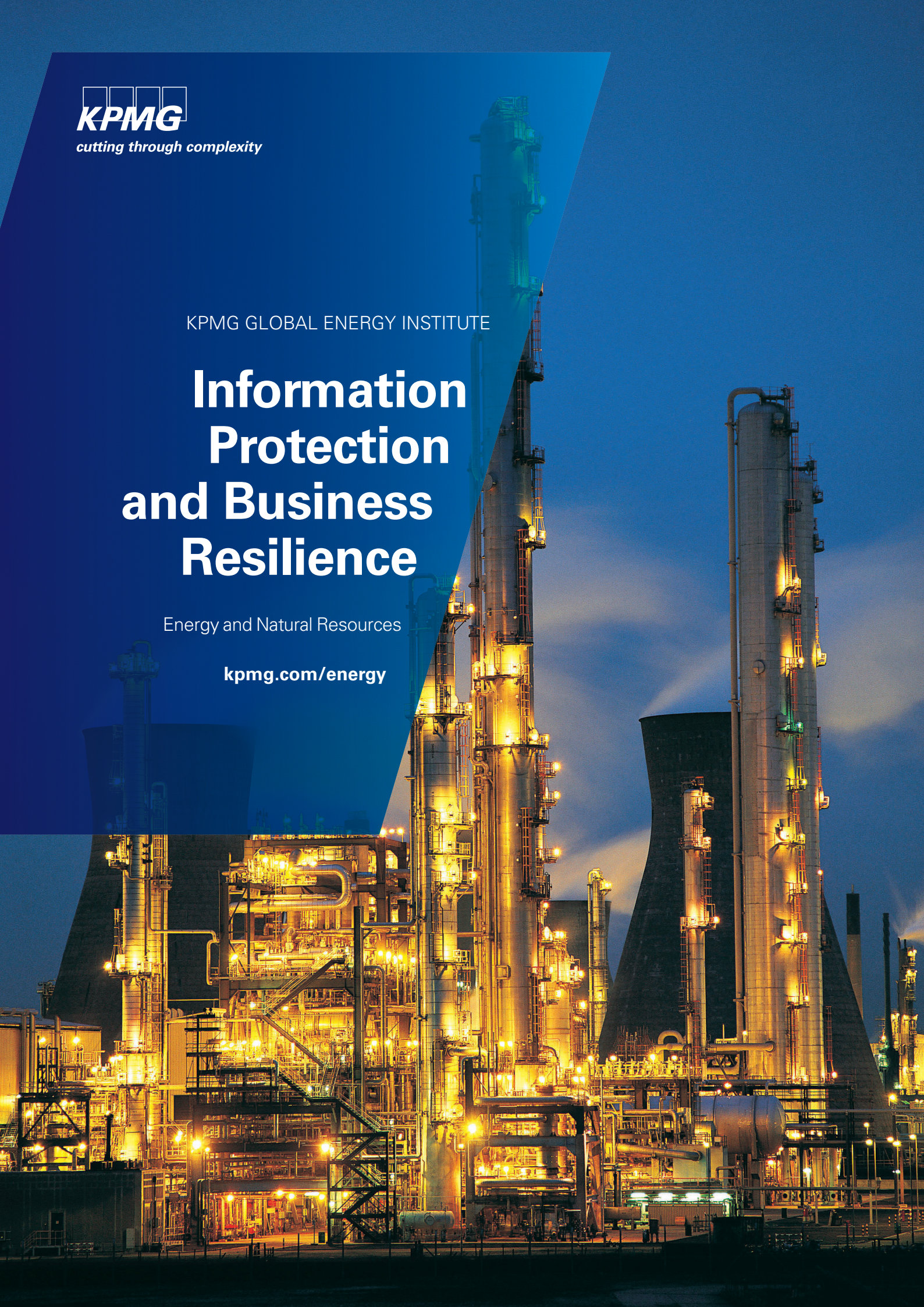
cutting through complexity

KPMG GLOBAL ENERGY INSTITUTE

Information Protection and Business Resilience

Energy and Natural Resources

kpmg.com/energy



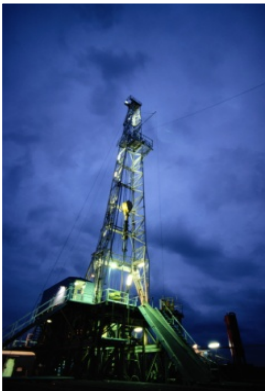


Energy and Natural Resources

KPMG's Information Protection and Business Resilience (IPBR) practice assists global organizations in transforming their information security risks and cyber security capabilities into business enabling platforms, while maintaining the confidentiality, integrity, and availability of critical business functions and systems.

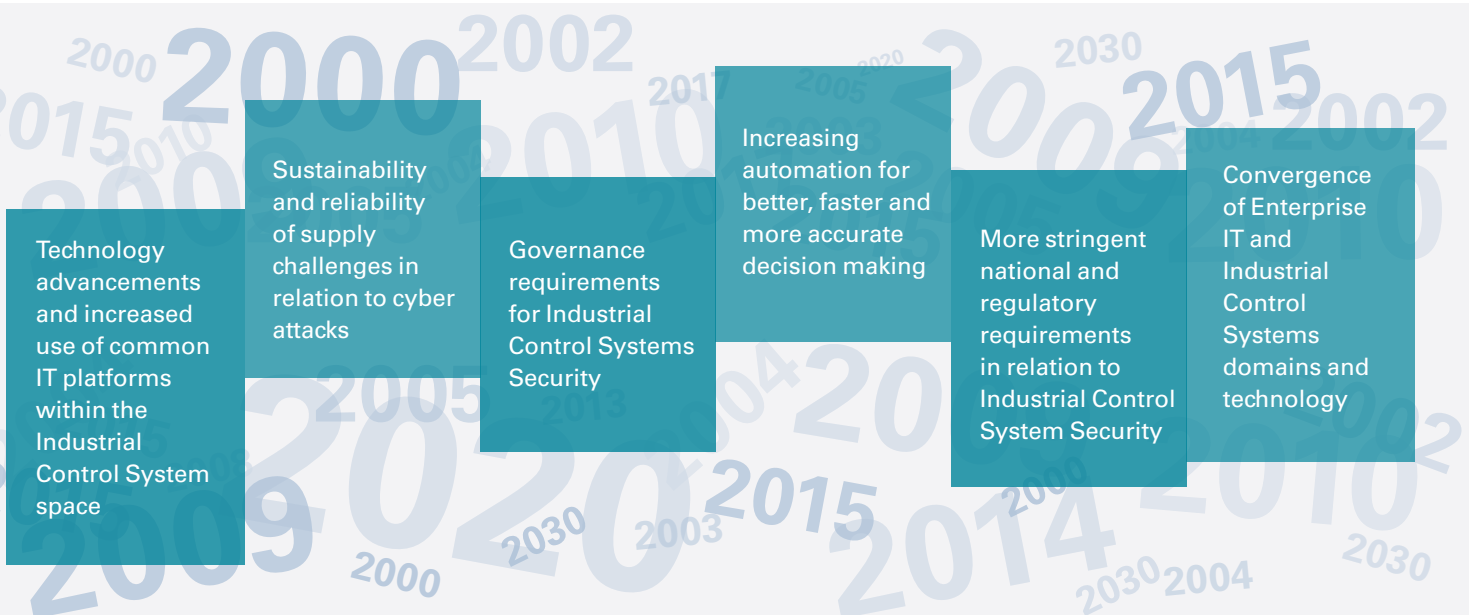
We help companies identify their most important information assets, and work with them to develop an effective approach combining technology and business processes to manage the information security risk and critical areas. We work with clients to enhance the value that can be obtained from their data while protecting key business processes, information assets, and the company's brand and reputation.

KPMG's Focus Around Industrial Control Systems Security



Over the past few years the cyber security landscape has been dramatically changing and evolving - both in terms of adopted technology, attack vectors and risk exposure. The landscape of cyber attacks is dramatically evolving and threats are becoming more sophisticated, targeting not only the enterprise IT system, but also systems supporting major production platforms, refineries, power grids within the critical infrastructure sector – also known as Industrial Control Systems (ICS).

KPMG has observed a major shift in the type, complexity and interconnectivity of the Industrial control systems, which leads to new risks and challenges faced by the organisations operating the ICS environments.



Industrial Control Systems Security Trends

With the increase in automation and interconnectivity, the landscape and therefore the exposure to risk has become more complex. New emerging risks have been identified within the enterprise risk management space, including areas such as safety risks related to security incidents within the ICS environment, cyber espionage for ICS, unavailability of critical systems within ICS environment, data integrity risks in relation to ICS systems, etc. It is becoming increasingly evident that organisations face an emerging set of new risks due to the evolving complexity of the ICS environment.

What do your peers see as typical challenges and what are they asking?

Who should own and be responsible for ICS security and how it should be governed? Is ICS Security the responsibility of the Engineering teams or IT teams?

How should we deal with inherent architectural limitations of the ICS Environment?

How do we work across the IT and engineering teams to better understand the threats to our ICS system?

How can we apply the ALARP, Bowtie Swiss Cheese Models in real world situation? Which will be the key top events, for which key preventive and recovery controls are placed?

How do we ensure the teams, who are planning, designing, implementing and operating the ICS environments understand the way cyber security risks impact the safety of the system?

Are the ICS teams trained in responding to ICS incidents in a manner which does not compromise the safety and integrity of the ICS environment?

Do we know how many ICS systems within our environments currently comply with security guidelines or are vulnerable?

Do our ICS teams have full visibility in the architecture of the ICS environment, including the subsystems and packaged equipment vendors?

How do we implement the technical security controls across all the different ICS systems, components and modules spanning all vendors within the ICS environment? Do we take into account packaged equipment vendors, or purely focus on main automation contractors?

How reliant are we on our vendors and how do we de-risk these highly reliant areas?

Do we have a central view of all our ICS assets with required security details and information?



How can we help address all these risks and challenges and turn them into advantages?

Our ICS Security Approach consists of seven critical steps organisations should take to address the ICS risk and challenges. The approach follows a systematic and logical order, that should be implemented sequentially, addressing all aspects of the ICS environment (from people to process to technology), giving you the confidence that your most critical ICS systems are secure.

Organisations may be able to perform some of these in parallel, but in our experience, following an orderly fashion proves to bring more success to ICS and Security Programmes, by helping avoid the common pitfall of speedy patchy projects.

Benefits

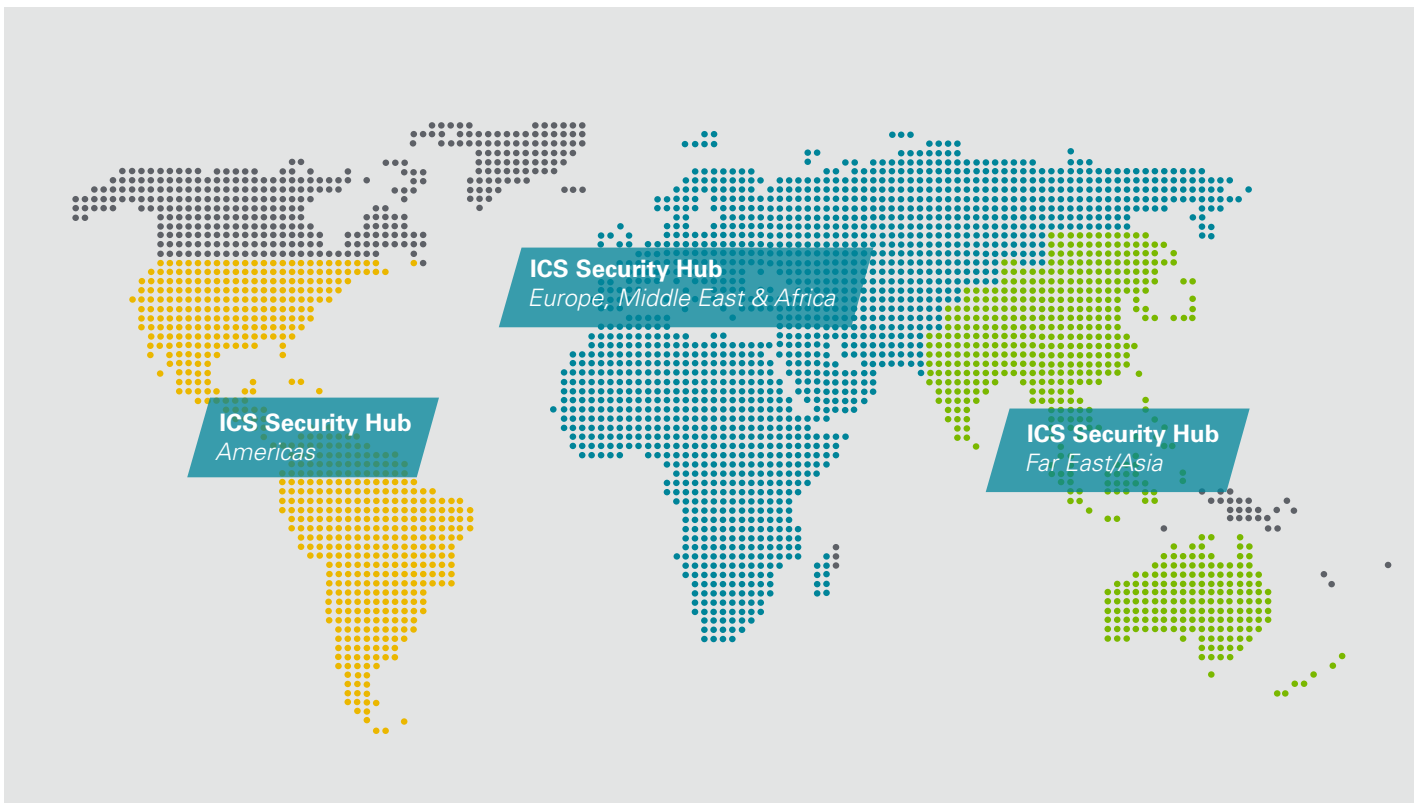
- For senior management, the approach provides visibility into the real-time risk profile so that informed decisions can be taken in timely manner and with correct level of control.
- For middle management, the benefit is clear communication with stakeholders and allocation of resources to the correct problem areas.
- For engineers and IT, the approach provides clarity of roles, appropriate training and ability to communicate issues openly and receive timely support.



How KPMG IPBR ICS Team Supports your Peers

Client	Work performed by KPMG
Large Power Generation, Transmission, Distribution and Retail Company in Asia	KPMG developed and implemented an Information Security Framework Programme, covering Power Generation, Distribution, Transmission and Enterprise IT sites for large power utility company. KPMG assisted the client with the definition of Governance model and Enterprise wide Information Security Policy, establishing the Information Security Organisation, sites prioritizations, and controls implementation across selected sites within the Industrial Control System and Enterprise IT environment.
Asia's Leading Power Utility Company	Provision of Security Test and Review for 22kV Distribution Management System (DMS) for an Asia's leading utility company. KPMG performed external and internal penetration testing on SCADA network infrastructure from five selected sites across the country to assess security posture of the SCADA system, including operation system, monitoring system, Remote Terminal Unit as well as network devices.
Power Generation Company in USA	KPMG performed a critical infrastructure protection program review to determine compliance with NERC CIP standards (CIP002–CIP009). The review focused on the architecture and security of the cyber assets at key generation facilities. In addition, KPMG conducted a detailed evaluation of the risk assessment methodology used to determine the criticality of the assets. As a follow-on, KPMG is providing assistance to the NERC CIP program manager in redesigning the current program and assisting with ongoing compliance audits.
Oil and Gas Major – PCN Security SME consultancy	KPMG mobilised a team of experts to the client's internal PCN/SCADA Project Management Office. The team provided vital advice to the Engineering team in the performance of risk assessments, prioritisation of remediation activities, compliance with Group policy, and PCN security reporting metrics for Management. With help from the client team, a managed programme to identify risks on the assets, interact with key stakeholders to identify remediation activities, define and implement controls, measure and report controls was completed. We have assisted in the implementation of a GRC tool to provide Management with real-time KPIs on PCN security across the globe.
Large Oil Company – SCADA/DCS risk control framework development and assessment	KPMG performed information and physical security risk assessments across 23 sites to assess compliance with FISMA requirements, NIST guidance, and DOE security policy. The security risk assessments entailed multiple platforms, including Windows, Oracle applications and databases, and Unix operating systems. In addition, KPMG performed comprehensive IT risk assessments of DOE operating environments.
Global Oil Company – Security review of wireless SCADA network	KPMG provided Subject Matter Experts (SMEs), including ethical hackers and specialised penetration testers, and KPMG's experiences from other organisations on a security review of wireless SCADA network engagement. KPMG formulated the following goal for the requested services; evaluate the current state of the wireless SCADA network from a security perspective and determine the risk of a successful attack by a malicious hacker or nefarious user. KPMG worked closely with both suppliers and business stakeholders to achieve improvements together by knowledge transfer and enabled the client to embed best practice into its functional and technical processes. KPMG delivered tangible improvements to multiple areas of security, including network segregation, physical access control, anti-virus, patching, reducing administrator privileges, certificate management, disabling unnecessary services, increasing end-user awareness, a new insights into appropriate security monitoring and the effective follow-up of security incidents.

Our Global ICS Reach



What sets us apart ?

Dedicated ICS Security Professionals and Global Reach

KPMG is a global network of over 140,000 professionals in 150 countries. We have dedicated ICS teams across the globe with the right **balance and depth of knowledge and experience in ICS design and maintenance**, information security and strong stakeholder management experience. Complemented with this we bring a team that has the skills in **independent ICS assessments**, remediation and project management.

We are an award winning Information Protection and Business Resilience team. We understand the importance of secure control environments and will **bring insights from what other clients are doing** to keep systems available while maintaining security across the estate of the key assets and platforms.

- We are a key member of the SANS GIAC steering committee on ICS certification. Among other members are BP, Chevron, ABB, Invensys and Yokogawa.
- We are a **member of the Repository of Industrial Security incidents (RISI)** and get regular insights on the trends and incidents occurring in the process control domain.
- We have relationships with leading specialist PCN services suppliers providing synergies, allowing us to keep current with industry trends and provide full life cycle PCN security services.
- As part of the KPMG Security Leadership Network Maturity Model we are working with G2M2 on providing inputs to ONG C2M2 development.

Industry Knowledge

Industry Share Forums

KPMG sponsors open forums hosted by leading Energy Companies that are designed to help provide executives a venue to discuss with their peers the critical industry issues facing the industry and the ways they affect their businesses.

Current Oil & Gas Topics

KPMG regularly produces Current Oil & Gas Topics, which are focused on a wide variety of subjects of interest to the Oil & Gas industry, including key issues around risk management, accounting, and tax issues. Each publication helps provide interpretation, insight, and pragmatic guidance.

Oil & Gas

Leadership and industry insight

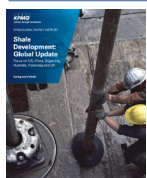
Leading the field means more than just having a strong client base. KPMG member firms already provide services to the world's leading Oil & Gas companies. Being the leader also means investing in developing thought leadership, spearheading industry debates to help keep our firms' clients at the forefront of progressive thinking, and giving our people the skills and knowledge to provide the quality and customized services our clients require.

Thought Leadership



Energy at risk

To download, go to <http://kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Pages/energy-at-risk.aspx>



Shale Development: Global Update – Focus on US, China, Argentina, Australia, Indonesia and UK

This report discusses the global shale market and developments in the big three — US, China and Argentina — as well as in Australia, Indonesia and the UK.



KPMG's US Energy Survey

2013 KPMG Energy Survey, now in its 11th year, reflects perspectives from US energy executives on the outlook for Oil & Gas prices, business challenges, the impact of shale Oil & Gas, alternative energy investments, spending and growth, emerging technologies, and other industry trends.



The Future of the European Refining Industry

The European refining industry has gone through numerous cycles, but this time many of the changes are likely to prove permanent. We expect the current trends of falling demand, rising imports, increasing European legislation, growing competition from emerging markets and eroding margins to continue.



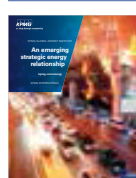
Exploring Opportunities in the Energy Value Chain

The KPMG Global Energy Institute conducted a program of workshops, surveys, interviews and research initiatives with key energy stakeholders from the Oil & Gas industry in Singapore. The study identified nine areas of opportunity which Singapore should focus on in order to remain competitive in the region.



No paper chase: Transforming risk management at energy and natural resources companies

Energy and natural resources companies are face an ever-growing array of risks. Today's complex business environment requires an even stronger ability than before to master risk management, but companies are falling short in important areas.



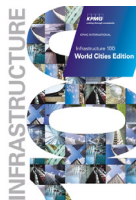
An emerging strategic energy relationship

The national oil companies of the Gulf Cooperation Council (GCC) are shifting gears. They are turning their attention eastwards, where the bulk of their exports will be headed for years to come. They are realizing that their Asian customers can provide a more holistic investment package. This report addresses some of the pressing economic challenges the region faces. Emerging trends points to a closer Gulf-Asia energy relationship.



INSIGHT: Resilience

In the latest edition of Insight, we explore some of the world's most impactful stories of resilience. We talk to infrastructure policy makers, owners, developers, analysts and investors to find out what keeps them awake at night and what they are doing to manage risk and enhance resilience.



Infrastructure 100: World Cities Edition

KPMG's Global Infrastructure Practice is pleased to present the much-anticipated second edition of the Infrastructure 100. Released at the World Cities Summit in Singapore, the Infrastructure 100: World Cities Edition provides insight into the infrastructure projects that make great cities, with a particular focus on the innovations that make them 'Cities of the Future' – places where people want to live and do business.



INSIGHT: Megaprojects

From managing risk and meeting timelines to selecting the right technology and investment partners, megaproject delivery offers important lessons and approaches that will resonate with almost any infrastructure stakeholder.



Performance Optimisation in O&G Upstream

Exploring sustainable upstream value – this paper points to a need for oil and gas companies to turn their attention to optimising internal operations as a means of building sustainable upstream value in their businesses.

Power & Utilities

Leadership and industry insight

Leading the field means more than just having a strong client base. KPMG member firms currently provide services to the world's leading Power & Utilities companies. Being the leader also means investing in developing thought leadership, spearheading industry debates to help keep our firms' clients at the forefront of progressive thinking, and giving our people the skills and knowledge to provide the quality and customized services our clients require.



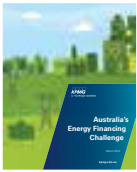
Green Power

This report provides insight into global mergers and acquisitions (M&A) activity in the renewable energy industry. The findings are based on a survey of 500 senior executives in the renewable energy industry worldwide.



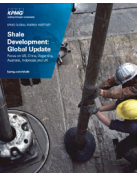
US Power & Utilities Outlook

Emerging 'smart' technologies, the shale gas revolution and aging infrastructure are some of the most significant factors impacting the Power & Utilities industry. Evolving federal and state policies to regulate environmental issues and financial derivatives, the need for greener energy and prioritization of necessary capital projects are also having an important impact.



Australia's Energy Financing Challenge

This report provides a wide-ranging perspective of the key immediate, medium- and long-term challenges facing the Australian energy sector, with particular emphasis on finance and investment, and has been written with a level of detail intended to address a broad audience across industry, government and financial services.



Shale Development: Global Update – Focus on US, China, Argentina, Australia, Indonesia and UK

This report discusses the global shale market and looks at developments in the big three – US, China and Argentina – as well as in Australia, Indonesia and the UK. It provides some compelling insights into an evolving sector as well as some pointers to the future shape of global shale markets.



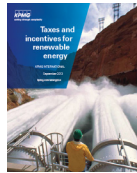
KPMG Global Power & Utilities Conference 2013 Recap Report

A recap report on the 2013 KPMG Global Power & Utilities Conference, KPMG's premier annual event for CEOs, divisional heads and financial executives of the Power & Utilities industry, bringing together 250+ executives from power producers, developers, investors, regulators and other industry stakeholders from over 40 countries around the world.



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Energy and natural resources companies are facing an ever-growing array of risks. Today's complex business environment requires an even stronger ability than before to master risk management, but companies are falling short in important areas



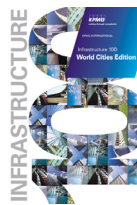
Taxes and Incentives for renewable energy 2013

KPMG's Taxes and Incentives for Renewable Energy – 2013 is designed to help energy companies, investors and other entities stay current with local country policies and programs supporting renewable energy around the world.



INSIGHT: Resilience

In the latest edition of Insight, we explore some of the world's most impactful stories of resilience. We talk to infrastructure policy makers, owners, developers, analysts and investors to find out what keeps them awake at night and what they are doing to manage risk and enhance resilience.



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KPMG's Energy & Natural Resources Industry Focus

KPMG's Energy & Resources practice provides executives with creative, proactive, and timely advice to support all critical business considerations. We aim to maintain our position as a leading advisor to the energy and natural resources sector by continuously developing strategic thought leadership and practical strategies that help our firms' clients meet their challenges. Our industry leading initiatives include:



KPMG's Global Energy Institute; a dedicated to helping organizations and their stakeholders identify and understand emerging trends, risks and opportunities. We do this by creating an open forum where peers can exchange insights, share leading practices, and access the latest thought leadership.



KPMG's Global Energy Conference in Houston; is our annual premier event for executives in the energy industry.



12 KPMG dedicated Oil & Gas Centers of Excellence (CoE) in key locations across the world; KPMG professionals and offices can be found in every major and growing oil & gas market, working closely with the industry and helping it to mitigate risks and embrace opportunities. The Oil & Gas Global network consists of dedicated professionals with extensive experience, providing a thorough understanding of the industry.



ASEAN Centers of Excellence (CoE) for ENR; based in Singapore for the Asia Pacific region, the first outside of the United States. The institute serves as a platform to facilitate knowledge-sharing and the flow of industry knowledge both into and out of the Asia Pacific region for energy sector executives.

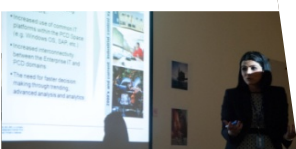
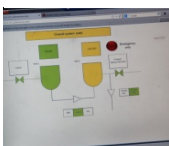
ASEAN Annual Oil & Gas conference in April 2013; provided views of regional industry updates; the conference agenda included sessions covering the opportunities for energy companies in Asia.



KPMG's Power & Utilities Conferences; the third annual KPMG Global Power & Utilities Conference, held in Berlin, Germany on November, 2013, once again brought together energy experts from industry, politics and society. Conference organizers Peter Kiss, Head of KPMG's Power & Utilities Practice, EMEA, and Michael Salcher, Head of Energy and Natural Resources, KPMG in Germany, welcomed over 200 decision-makers from energy companies, investors, regulatory agencies and other opinion leaders from more than 30 countries.



KPMG ICS Security Conference & Training ASPAC; security professionals from the International KPMG Community, who are actively involved in advanced cyber security and security in the process control domain, presented their latest developments in PCD/ICS environments, discussed Cyber Threat and performed several hands on demonstrations. In addition, our client from the ENR sector participated in the red/blue team testing which involves becoming part of a cyber defense team for Real Factory and learned various techniques in managing advanced attacks within PCD/ICS.



KPMG ASPAC SCADA Security Training, Kuala Lumpur, Malaysia; more than 30 KPMG ASPAC security professionals from more than 7 countries attended the SCADA Security course with over 20 exercises and labs that are performed on a portable SCADA lab that contains over 15 different PLCs, RTUs, RF, and telemetry devices commonly used by our major ENR clients.

The KPMG Global Energy Institute (GEI):

Launched in 2007, the GEI is a worldwide knowledge-sharing forum on current and emerging industry issues. This vehicle for accessing thought leadership, events, webcasts and surveys about key industry topics and trends provides a way for you to share your perspectives on the challenges and opportunities facing the energy industry – arming you with new tools to better navigate the changes in this dynamic area. To become a member of GEI visit

kpmg.com/energy



#KPMG_GEI

The KPMG Global Energy Conference (GEC):

The KPMG Global Energy Conference (GEC) is KPMG's premier annual event for executives in the energy industry. Presented by the KPMG Global Energy Institute, these conferences are held in both Houston and Asia Pacific and bring together energy executives from around the world in a series of interactive discussions with industry luminaries. The goal of these conferences is to provide participants with new insights, tools and strategies to help them manage industry-related issues and challenges.



#KPMGGEC



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