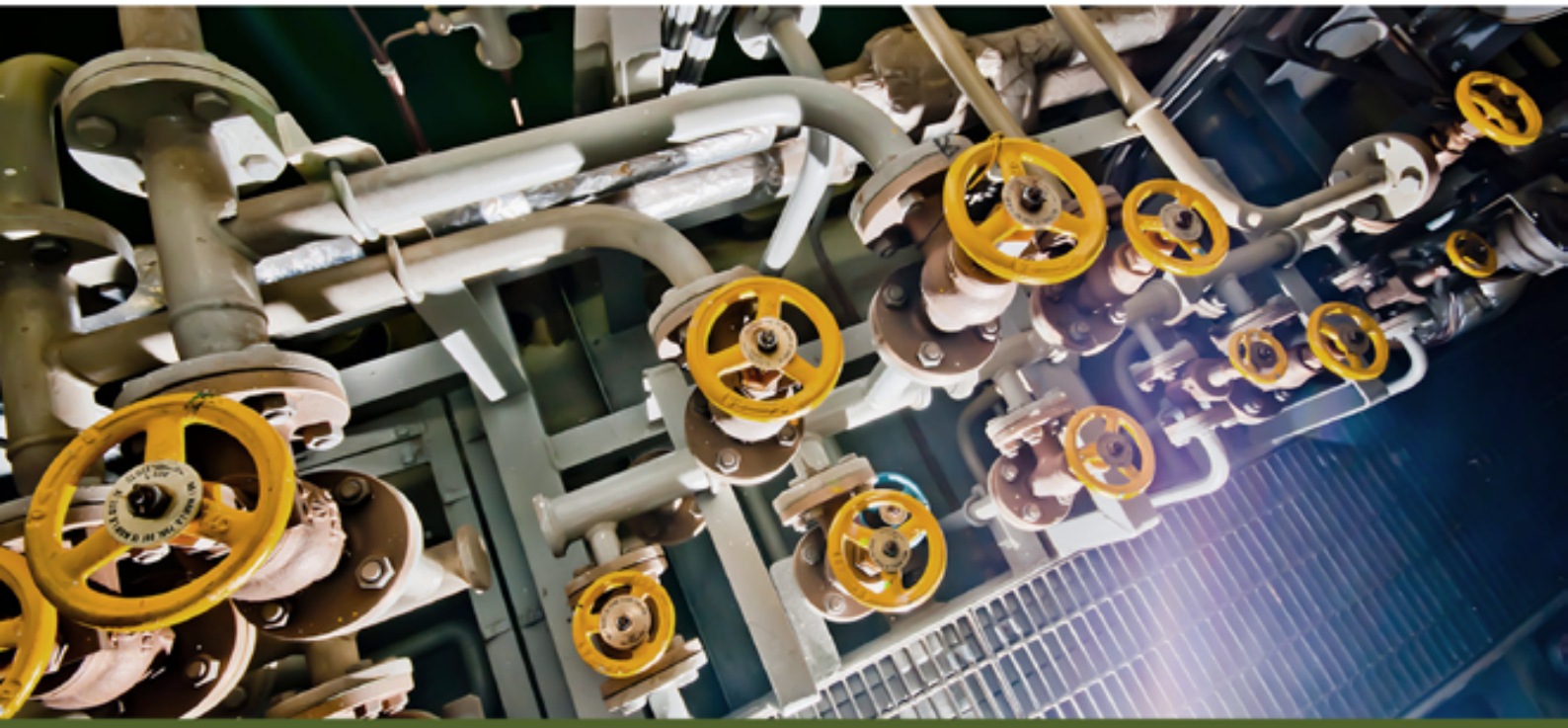
N.2 NEWSLETTER

July 2020

SecureGas



Securing The European Gas Network

IN THIS ISSUE:

- SecureGas – What's new? COVID-19 impact on the project
- SecureGas Business Cases – Recent developments and planned activities

... ***and more!***

SecureGas project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 833017

SUMMARY

SECUREGAS NEWSLETTER N.2

SecureGas
Securing the European Gas Network

SecureGas Newsletter is the official, semi-annual newsletter from Horizon 2020 SecureGas Project. Each SecureGas Newsletter issue aims to disseminate project updates as well as news. It is developed and compiled with contributions from the SecureGas Consortium Partners and relevant Stakeholders.

Realised by APRE

SecureGas – What's new? COVID-19 impact on the project

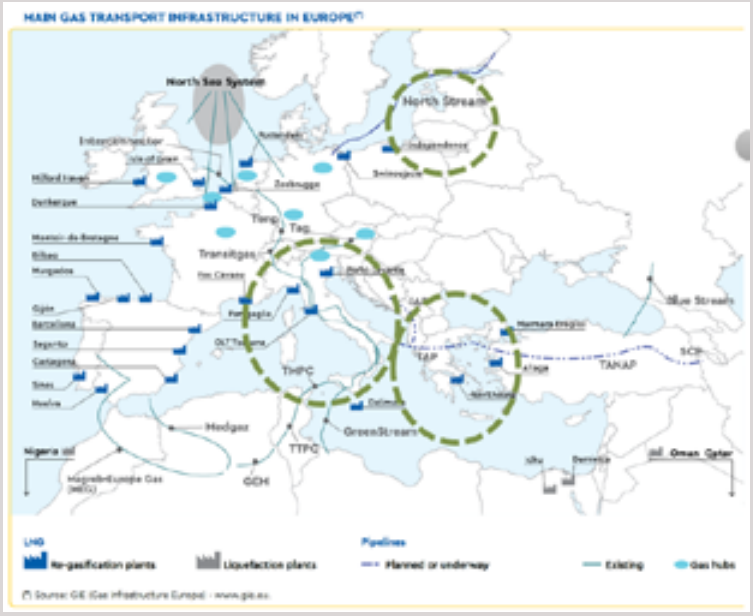
Clemente Fuggini (RINA)
Project Coordinator

SecureGas is now entering in its **2nd project year**, **corresponding to the launching and execution of piloting activities at selected sites and installations**, where customized and adapted SecureGas solutions and services will be deployed, tested and validated.

The last months have been particularly critical for the project due to the impacts of COVID-19 pandemics.
Since the very beginning of the pandemic, SecureGas has constantly monitored its spread and revised/updated the impacts caused on the working activities as well as the restrictions to work and travel that have been imposed at country (member states) levels.
In fact, SecureGas had to stop physical meetings from the end of February 2020 and any kind of activities that needed a physical presence on site, such as pilots activities.
Despite this SecureGas has not stopped at all working and delivering in accordance to its contractual obligations and to stakeholders expectations.
In the last months, consortium meetings have been successful hold remotely and all technical activities have been discussed in the same way.
Moreover, SecureGas has been very active on communicating the project itself and its preliminary results to its stakeholders and to the public at large.
Notably, among the others, **3 SecureGas Video Pills**, **2 SecureGas Webinars** and **the campaign #StayAtHome**.

SecureGas partners are now ready to restart physical meetings and to attend the next events to disseminate the project results. Our dissemination and exploitation strategy is propaedeutic to the project ambition **to offer tangible and operationally-ready solutions and services to increase the security and resilience of the EU gas network and installations against cyber and physical threats.**

SecureGas Business Cases - Recent developments and planned activities



SecureGas focuses on key elements (e.g. installations, pipelines) of the +140.000 Km of **the European Gas network** from Production to Transmission up to Distribution in 3 specific targeted areas:

- **Greece**
- **Lithuania (Baltic states)**
- **Italy**

Three business cases, addressing relevant issues for the Gas sector and beyond (e.g. oil), **have been identified within SecureGas to ensure the delivery of solutions and services in line with clear needs and requirements**, focused on:

- risk-based security asset management of gas transmission and distribution networks;
- impacts (economic, environmental and social) and cascading effects of cyber-physical attacks on interdependent and interconnected European Gas grids;
- integrity and security, through the operationalization of resilience guidelines, of strategic installation across the EU Gas network.

SecureGas extended components, integrated and federated according to an High-Level Reference Architecture built upon the SecureGas Conceptual Model, will be contextualized, customized, deployed, demonstrated and validated in each business case, according to the scenarios defined by the end-users.

Below, **an overview of each Business case** is provided, explaining activities carried out, planned steps and impact of COVID-19 on Business Cases development.

Business Case 1 (Greece)

OBJECTIVES

SecureGas follows a Business Case (BC) driven approach, with three main phases: Construction, Demonstration and Validation & Diffuse. In this direction each BC addresses the customization, deployment, and testing of the SecureGas high-level reference architecture (HLRA) and the extended components. This will result in the deployment of a specific security solution (i.e. SecureGas service), integrated as far as possible into operations and evaluated by the business case owner (i.e. DEPA, EDAA) during pilots activities.

BC1 of SecureGas addresses: Transportation and Distribution (Midstream up to Downstream) of Gas at strategic (project planning), tactical (project risk assessment) and operational (Distribution Network) level. It is compliant to EU Regulation 2017/1938 for **"A risk-based approach to assessing the security of supply and establishing preventive and mitigating measures enables efforts to be coordinated and brings significant benefits in terms of the effectiveness of measures and optimization of resources"**.

The Critical Infrastructures that will integrate Secure-

Gas solution and will act as the BC1 owners, are that of DEPA and EDAA, supported by KEMEA and the technical partners (WINGS, INNOV, GAP, EXUS, IDMG).

SCENARIOS

Two different types of scenarios will be used in order to validate and evaluate the SecureGas solution, in an effort to combine security and resilience aspects across both midstream and downstream gas infrastructures.

- **A strategic risk assessment during life-cycle management of a cross border hypothetical pipeline.** This strategic scenario engages multiple owners and operators to simulate key security and resilience issues, and analyzes potential threats and hazards affecting the delivery of natural gas related to spatial planning of gas networks, (gas) network unavailability risks, and diverse sources of threat. Output will focus on defining generic risks applicable to all modern midstream architectures along with potential solutions and design security measures.

- **Attack scenarios involving downstream infrastructures.** Potential attacks on downstream Distribution System Operator (DSO) infrastructures are reviewed along with their interconnections to other CIs. Validation scenarios include both physical, cyber and combined attacks, that target modern control, storage and distribution systems, including industrial systems and networks, in both suburban and dense urban environment.

Attack scenarios will test the integrity of pilot infrastructures against security related incidents. Both malicious actors and unintended failures are incorporated into a holistic framework where scenarios play a pivotal role in engaging, testing and upgrading the SecureGas solution. Moreover, the proximity of strategic gas network nodes, distribution endpoints and assets to populated areas and sensitive receptors as well as to other CIs, which is deemed as one of the most important and integral parameters of the risk assessment and management procedure, is being taken into consideration within BC1.

All scenarios have been defined, and their execution specificities are being finalized. Soon, the SecureGas solution will be tested under demanding adverse situations.

RECENT DEVELOPMENTS

Currently, procurement procedures are underway for obtaining all necessary equipment for the initial SecureGas installation. Sensor positions, installation procedures and component setups have been finalized, along with integration specifications for the existing DEPA and EDAA infrastructure. Re-use of current infrastructure and specific connectors for relevant information exchange has been mapped onto SecureGas components and the structure and analysis of content is finalized. Extended components are now customized to meet the specific requirements and issues of the BC1. Whenever feasible, existing infrastructure and legacy systems at DEPA and EDAA are involved.

Recent developments can be summarized in the following steps:

- Legacy integration systems have been identified and combined with the SecureGas solution
- SecureGas components have been configured and datasets identified for ease of installation
- Implementation on pilots has begun and procurement is under way for sensors and hardware.
- The entire process is being documented in extended technical reports to facilitate integration.

PLANNED ACTIVITIES

Planned activities involve the deployment and on-site test run of the SecureGas system according to the aforementioned system requirements and reference architecture. IT/OT infrastructure tests will be run to collect data, test detection rates and validate the respective requirements of the Business Case 1. The entire process is being documented as a brief guideline, which will be finalized once the initial installation of the SecureGas solution is complete.

A **two-phase approach** will be followed: **a first on-site integration pilot** will ensure the proper deployment of the SecureGas solution to BC1, while **a second demonstration pilot** will allow for the proper validation of the integrated system. These pilots will be organized and implemented in accordance to the Validation Plan that is currently finalized, applying to all three BCs.

Each deployment provided to the BC1will be carefully evaluated concerning its applicability for DEPA and EDAA as well as its possible limitations that have to be considered during system architecture design or development. End-users and stakeholders will also evaluate the SecureGas solution and the technical components, through dedicated evaluation tools and methods (e.g. questionnaires, interviews, etc.).

IMPACT OF COVID-19

Currently, the international pandemic of COVID-19 introduces novel challenges, especially to the procurement of components, but also to field surveys and tests that need to be conducted live in each infrastructure. The global lockdown has brought along extended delays in the supply chain and difficulties in managing on-site implementations.

Through the diligence of all BC1 partners, alternatives are being examined so as to speed up processes and implement systems with as little physical relocation as possible. The project extension, signed by the Commission few weeks ago, allows all partners to take advantage of the extra time so that better results and finer solutions on the procurement of necessary equipment are provided.

RESULTS

The expected impact of the BC1, is summarised to the following aspects:

a) To advance the resilience capabilities in combination with a disaster Life-Cycle Management Process via a Gas CI-contextualized Panarchy loop, with the aim to reduce foreseen risks, optimize monetary investment and reduce uncertainties of a strategic Gas pipeline project.

b) To operationalize resilience guidelines and impact assessment models for maximum business continuity and non-disruptive operations through effective preventative actions and emergency plans including interconnected gas networks in severe crisis situations affecting EU gas supply.

c) To apply resilience and impact guidelines so as to validate sustainable and security-tested solutions to the end-customers and consumers via the strong dependencies on connecting grids.

d) To promote effective implementation of Regulatory Instruments and Standardization Initiatives for Gas CIs.

e) To proactively raise awareness via dynamic approaches to inform population, providers and operators for representative risk scenarios and educate them in adopting appropriate behaviors for EU security and safety.

f) To demonstrate a systemic security risk and resilience management approach including the combination of physical and cyber threats, their interconnections and cascading effects.

g) To implement improved, integrated solutions to prevent, detect, respond and mitigate threats and their customization to specific installations.

h) To assess the customized solutions through an extensive set of KPIs and establishment of a trustworthy mechanism for sharing information and best practices.

i) To identify and develop of viable and effective security paradigms validated through BC1.

Business Case 1

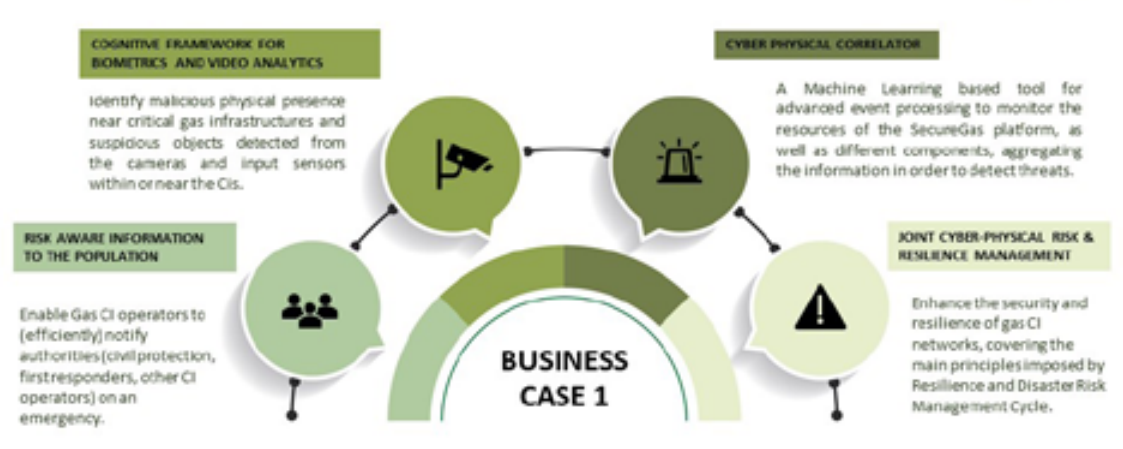


Figure 1 - BC1 | Components

Business Case 2 (Lithuania)

OBJECTIVES

Business case 2 , "**Impacts and cascading effects of cyber-physical attacks to Strategic Nodes of the Gas network**" addresses the adaptation, customization, deployment, and testing of the SecureGas HLRA and the extended components. This will result in the deployment of a specific security solution, integrated as far as possible into operations and evaluated by the business case owner during pilot activities.

SCENARIOS

BC2 is structured into three standalone use cases:

- Use case 1: "*Risk assessment of pipeline hub*"
- Use case 2: "*Methane leak detection by an unmanned aerial vehicle*"
- Use case 3: "*Remote control deployment of valves*"

All these independent solutions will be interlinked by risk assessment umbrella.

ACTIVITIES CARRIED OUT AND RECENT DEVELOPMENTS

Recently the Task 5.1 was completed – the definition of the Business case 2 scenario was prepared and submitted to the PO.

This report presents the first deliverable of WP5 which is a work package of Business case 2, the one that will take place in Lithuania. A specific methodological approach has been opted for the Business Case 2 scenarios. This has been based on the principle of segmenting the underlying background information which will be exploited in the derivation / description of a realistic operational scenario.

The aim has been to achieve a deeper level of analysis as to who does what and when (per case), given the valid operational context. According to the foreseen scenarios for this BC, the relevant technical components of the SecureGas solution, will be selected and customized in line with the needs and constraints as defined by the scenarios, and then, will be integrated and unified according to CM and HLRA. Special attention is paid in order that the business case scenarios meet the realistic needs/priorities of the end-users and maximize the training / coaching opportunities offered to the end-users.

Finally, this assessment aims to provide the preconditions for further improvement and broader implementation/use of the suggested solution(s).

ACTIVITIES PLANNED FOR NEXTMONTHS

For the next months it is being planned to perform activities related with Task 5.2 "SecureGas components customization to Business case 2" and task 5.3 "SecureGas system Adaption and infrastructure setup for Business case 2".

There are physical meetings of the partner's experts planned for the use case 1 – initial meeting for the risk assessment of a pipeline hub. T**his study will take all-hazards, all-threats approach by analyzing in detail natural hazards likely to happen in the area (forest fire, extreme cold, hurricane), external events (airplane crash), technical failures (pipeline corrosion, compressor failure, valve inadvertent closure), human errors (operators actions, unauthorized ground works), intentional human malicious actions on site (terrorist acts) or cyber-attacks.**

The methodological basis for the study will be a hazard and operability (HAZOP) methodology, enriched by some elements of FMECA (failure mode, effect and criticality study).

The study will take results from modelling customized component for quantification of consequences in terms of security of supply in the whole gas network. It is also being planned to perform activities related to use case 3 – site survey of the pipeline hub. The result of these activities should be verification of the priority list of valves that are currently being connected to SCADA and development of a priority list to those valves that are currently not connected to SCADA.

IMPACT OF COVID-19

The performance of Business case 2 activities was interfered by the COVID-19 outbreak for a few months due to travel restrictions and suspended business operations of the project partners.

However, the extension of the project timeline and final terms, will allow to achieve the goals set in the grant agreement.

Of course, the uncertainty with pandemic situation across the world remains and this could affect the implementation of the project. Hence, we should exploit the improving situation in the Europe during the summer months.

CHALLENGES

The biggest challenge for the Business case 2 implementation is is related to the availability, implementation and development of an UAV-based solutions for gas methane leakage detection. Investigations are still ongoing to define the best concept of operation and related solution so that the use case will be successfully implemented.

PLANNED IMPACT/RESULTS

It is planned that the selected components of the use cases will be customized in line with the need and constraints as defined by the scenarios, and the, integrated and unified according to CM and HLRA into the existing Amber Grid infrastructure.
This will result in the deployment of the SecureGas solution, integrated as far as possible into operations and evaluated by the business case owner during pilots' executions.

The business case owner will continuously provide feedback to the providers to ensure that the results will meet their requirements.

Business Case 2

Figure 2 - BC2 | Components

Business Case 3 (Italy)

OBJECTIVES

Business Case 3 defines the workpackage addresses the adaptation, customization, deployment, and testing of the High-Level Reference Architecture (HLRA) built upon the SecureGas system and the extended components.
The customization, deployment, and testing of the SecureGas HLRA and the extended components to be defined in Business Case 3. This will result in the deployment of an advanced technological solution, integrated as far as possible into operations and evaluated by the business case owner (i.e. ENI) during the pilot activities.

SCENARIOS

In the **BC3** the scenarios have been defined and will be used for **the pilot activities on Chivasso-Aosta 16" ID pipeline (100 km long), North Italy.**

In order to define the deployment scenario, analysis of the current treats, potential improvements, identification of critical assets, vulnerabilities and business impact have been focused.
Six different scenarios regarding the BC3 owner, including the relevant actors, technology, systems and use case descriptions have been selected:

- Scenario A – Third Party Interference enhancement
- Scenario B – Attack to e-vpms system: signal tampering
- Scenario C – Physical event identification
- Scenario D – «Man-in-the-Midde» attack to SCADA system
- Scenario E – Environmental Patrol with Drone
- Scenario F – Prescriptive Intelligence for Recovery

ACTIVITIES CARRIED OUT AND RECENT DEVELOPMENTS

Feasibility studies for providing the experimental plan to be used in BC3 has been defined with the SecureGas partners involved in the workpackage.

ACTIVITIES PLANNED FOR NEXT MONTHS

Survey on Eni's operational sites and feasibility design layout for installation of the extended components to be carried out on next months. The full scale tests related to the different scenarios will be provided in two seasonal periods (e.g. summer, winter).

IMPACT OF COVID ON THE BUSINESS CASE DEVELOPMENT

Smart working has been mainly used by the Partners in different European countries (i.e. Italy). The impact of COVID has been limited on two months' delay and the Business Case development is ongoing.

CHALLENGES

SecureGas components can be tested in full scale gas pipeline network for different scenarios. Asset integrity management (i.e. prevention, detection, mitigation of combined physical & cyber threats to critical infrastructure in Europe) to be enhanced. Improving resilience in the interconnected Gas Transport system the Energy Transition can boosted n Europe.

PLANNED IMPACT/RESULTS

The results of the BC3, which is an effective solution (i.e. SecureGas services), to be integrated as far as possible into operational strategies and evaluated by the Business Case owner (i.e. Eni, Italy) during the pilot's activities. The business case owner will provide feedback to the Partners to ensure that the results will meet the project requirements (i.e. Design, Technical, Operating). Technology validation for the SecureGas components in full scale gas deployment scenario's. KPIs performance analysis of results in term of detection, localization and sensitivity. Gap analysis and integration design for possible SecureGas services. European Gas Grids Stakeholders discussion for planning Business development in Upstream, Midstream, Downstream.

Business Case 3

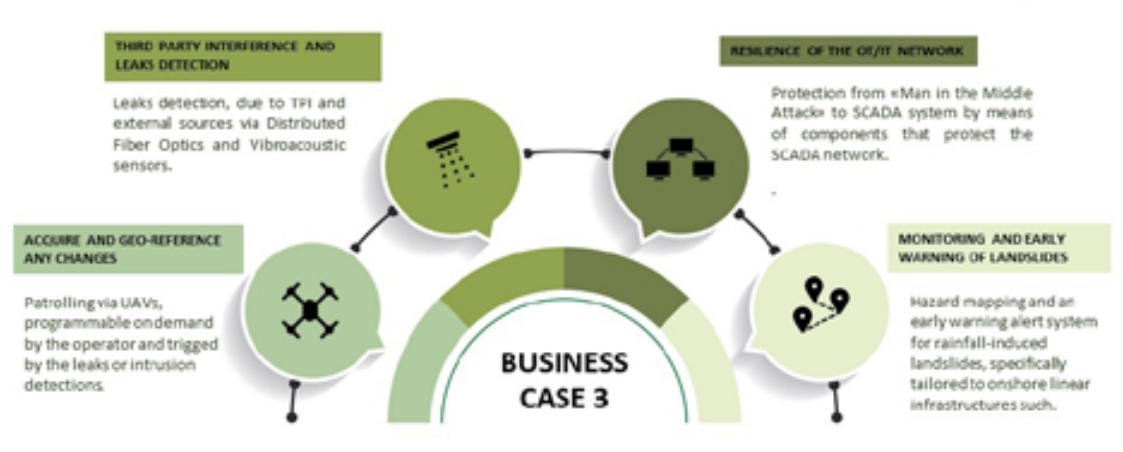


Figure 3 - BC3 | Components

GIVE US YOUR FEEDBACK!

[Write to: **info@securegas-project.eu**]

- *Do you think there is a need for more resilience, design to costs and energy efficiency to achieve a future business development in the Gas sector in Europe?*
- *Do you think there is a need for upgrading Asset integrity management for Gas networks and installations?*
- *How do you think SecureGas can support the Energy Transition challenges in Europe?*

SecureGas social media: *"Follow us and stay tuned!"*

SecureGas is very active on its social media!

We regularly share most recent developments in the project and project results and show our activities like event participation, invitation to project events, etc.

If you want be updated, **FOLLOW US** on:

TWITTER	LINKEDIN	YOUTUBE
@secure_gas	**@SecureGas**	**SecureGas H2020 project**

In specific, on **YouTube** you will find **two SecureGas webinars** that were organised during the COVID-19 pandemic.

WATCH THE VIDEO:
1st SecureGas webinar | *"Risk and problem we target and technological solutions we propose"*

WATCH THE VIDEO:
2nd SecureGas webinar | *"SecureGas Business Cases"*

You will learn about latest activities, solutions we propose and details about Buisiness Cases.

SecureGas: "*We have been there!*"

- **MILIPOL 2019**
  19 – 22 November 2019, Paris, France

- **Round table of Technology Platform Energy Security**
  25 November 2019, Prague, Czech Republic

- **New Space Economy**
  10 – 12 December 2019, Rome, Italy

- **First Project to Policy Kick Off Seminar (P2PKOS) - H2020 | SC7 "Secure Societies"**
  31 January 2020, Brussels, Belgium

These events represented an important opportunities to diffuse the knowledge about the project at European level and to promote its achievements and objectives.

....to discover the other events visit the SecureGas website and follow us on the social media!

SecureGas

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