

EDITORIAL

We are happy to deliver the 4th newsletter of the EXPOSOGAS project. This is a Horizon 2020 Twinning project that will promote the training and career development of researchers in the field of occupational and environmental health sciences. Special focus is paid on the general population in communities near oil and gas activities, as well as workers in this sector, using human exposome tools. We hope you will find this newsletter informative. If you have any questions or comments, please get in touch with us!

Konstantinos C. Makris, PhD
EXPOSOGAS project coordinator

What is EXPOSOGAS about?

EXPOSOGAS is a 3-year project funded by the European Union, which aims to develop the research capacity of the Cyprus International Institute for Environmental and Public Health (CII) in using the human exposome platform and tools. EXPOSOGAS will use the exposome framework for assessing, managing and communicating information about the overall health risk of hydrocarbons operations to workers and the general population.

What is the human exposome?

The human exposome is a relatively new framework for conducting research. The exposome concept was first coined by the cancer epidemiologist Dr. Christopher Wild in 2005, who defined it as the cumulative set of all non-genetic (i.e. environmental) exposures which an individual experiences from the moment of conception throughout their life. Thus, exposome studies focus on the effects of multiple environmental exposure and consequent health-related outcomes.

What is EXPOSOGAS interested in?

EXPOSOGAS is interested in oil/gas operations that often involve exposures to multiple chemicals, shift work, noise, high temperatures, and ergonomic and psychological factors and the collective impact on health that these multiple exposures have. Important operation stages of hydrocarbons occur throughout the industry lifecycle and include the preparation and installation, production, transport, storage, distribution, use and end of life activities and each of these will affect health differently, thus increased training is necessary in order to be able to establish how health is affected across the stages.

Why focus on the oil and gas industry in Cyprus?

The oil and gas industry in Cyprus is growing fast, especially with the recent discovery of the natural gas reserves in the Cypriot exclusive economic zone (EEZ). In order to increase the autonomy and energy independence of the Southern European region, the EEZ region is of primary importance. However, given the expansion of the oil and gas sector in Cyprus, there is also a need to similarly increase the capacity of the occupational and environmental health sciences in maintaining active surveillance of affected communities.

How will we do this?

Primarily by promoting the training and career development of CII researchers in the field of occupational and environmental health sciences through training that teaches them how to apply the exposome concept and related technologies on workers directly involved with oil/gas activities. EXPOSOGAS is actively trying to engage stakeholders and the general public to express their views as a means of furthering the exposomic framework.

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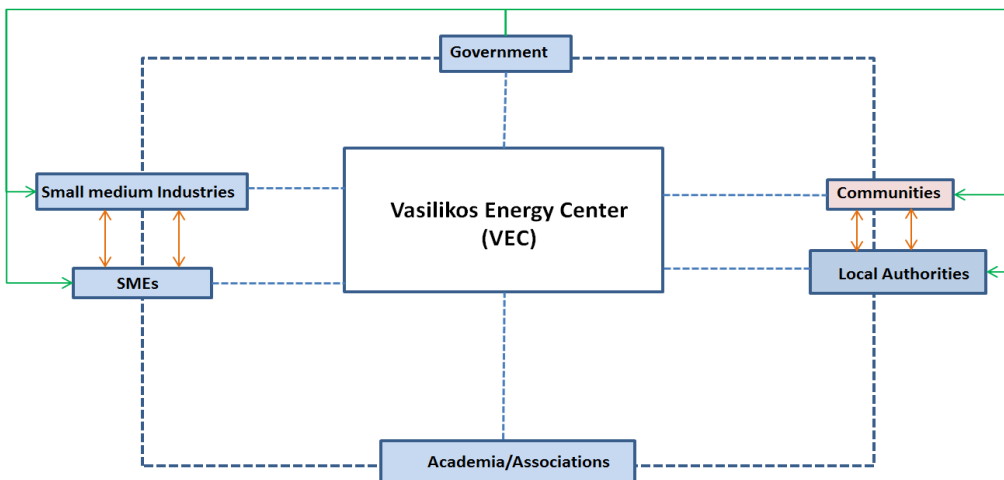
For more info, please visit
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and [our Facebook Page](#)

PROJECT ACTIVITIES

Engagement with Stakeholders and Exploitation in Vasilikos Energy Center (VEC), Cyprus

- This study describes the stakeholder engagement activities undertaken in the EXPOSOGAS project, focused on the Vasilikos Energy Centre (VEC), Cyprus.
- The main objectives of the stakeholder engagement activities were to: (a) identify stakeholders/key persons of organizations and entities involved with hydrocarbons activities in Cyprus, (b) assess their understanding, acceptance and (future) application(s) of exposome-based technologies, (c) evaluate their perceptions on environmental, safety and health risks related to the hydrocarbons activities (d) communicate with them the project outputs

Schematic depicting stakeholders involved in the Vasilikos area including the VEC



Stakeholder engagement activities

- Interviews, workshops, meetings
- Population survey

* The different lines' colors represent the interaction between the stakeholders

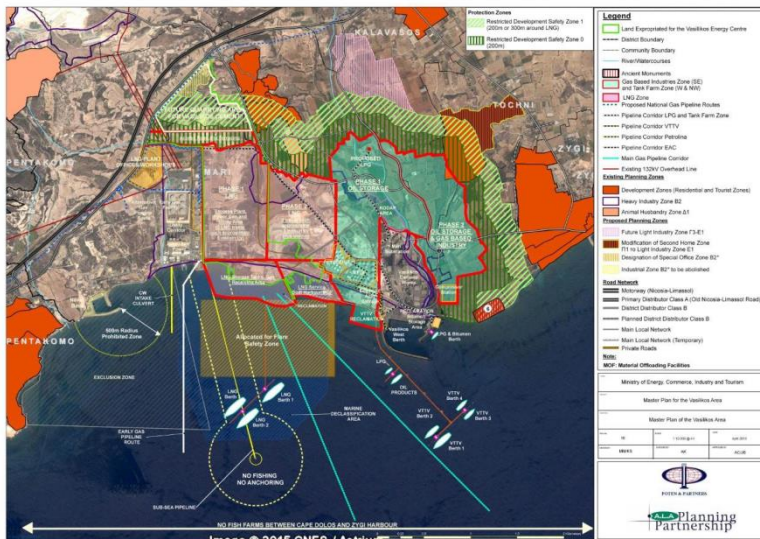
Key points

- All interviewed stakeholders expressed the immediate need for population health studies to be conducted for the VEC and its surrounding residential communities, including systematic measurements of gaseous pollutant emissions.
- Stricter policies by government about licensing, monitoring of hydrocarbon activities and proper/correct information to the public and mass media emerged as important needs.
- The usage of exposome concept was reportedly not practiced by the industry/SMEs, however small-medium industries in particular showed willingness to use it in the future, upon proper testing/evaluation of its utility.

PROJECT ACTIVITIES

Engagement with Stakeholders and Exploitation in Vasilikos Energy Center (VEC), Cyprus

Future Steps



Map of the Vasilikos communities and the surrounding industrial area of Vasilikos (VEC) (Cyprus Department of Environment, 2015)

Based on the stakeholder engagement analysis, the following activities need to take place:

- Share the findings with all stakeholders and ask for their comments and feedback.
- Organize a workshop open for all (in online form due to COVID-19 restrictions) to present findings of the stakeholder engagement process, discuss about the needs and gaps and suggest solutions.
- Discuss with stakeholders the implementation of a population health surveillance study (assessment of environmental and health risks in the VEC) and explore future synergies and interactions in the field.

Are you interested in receiving news about our future events?

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Webinars

Webinars are scheduled frequently for Public Health young researchers. These webinars include the use of novel technologies such as sensors, big data and smart phone applications for the assessment of the external exposome; human biomonitoring, omics platforms and bioinformatics, for the internal exposome, and toxicokinetic models that can help bridge the relationship between the external and internal exposomes.



WEBINAR 26/11/2020
15:00 - 16:00
"Dermal exposure assessment"

Speaker: Dr. Karen Galea
(Workplace Exposure, IOM, Edinburgh)



Dr. Karen Galea's webinar on
November 26, 2020.

"Dermal exposure assessment"

Dr. Karen Galea, Institute of Occupational Medicine (IOM) presented a webinar on November 26, 2020 on the topic Dermal exposure assessment. Dr. Galea explained why dermal exposure is important and introduced the pathways by which people can become exposed via this exposure route. It was explored the various measurement techniques available to determine dermal exposure (interception, removal and in-situ) and the benefits and limitations of each.



WEBINAR 30/03/2021
15:00 - 16:00

HBM4EU Chromates Study - Reflection and lessons learnt from designing and undertaking a collaborative European biomonitoring study on occupational exposure to hexavalent chromium

Speaker: Dr. Karen Galea
(Workplace Exposure, IOM, Edinburgh)



Dr. Karen Galea's webinar on
March 30, 2021.

"HBM4EU Chromates Study - Reflection and lessons learnt from designing and undertaking a collaborative European biomonitoring study on occupational exposure to hexavalent chromium"

Dr. Karen Galea presented a webinar on March 30, 2021 to the CII's students and researchers. The EU human biomonitoring initiative, HBM4EU, aims to co-ordinate and advance human biomonitoring (HBM) across Europe. As part of HBM4EU, a multicentre study to characterize occupational exposure to hexavalent chromium (Cr(VI)) in nine European countries (HBM4EU chromates study) was undertaken. This study intended to collect data on current occupational exposure and to test new indicators for chromium (Cr) biomonitoring (Cr(VI) in exhaled breath condensate and Cr in red blood cells), in addition to traditional urinary total Cr analyses. Also, data from occupational hygiene samples and biomarkers of early biological effects, including genetic and epigenetic effects, was obtained, complementing the biomonitoring information. Data collection and analysis is complete, with the project findings to be made separately available. As HBM4EU prepares to embark on further European wide biomonitoring studies, the team considered it important to reflect on the experiences gained through the harmonised approach.

You can get informed about upcoming webinars through our platforms:



Presentations, courses, conferences

WHO European Healthy Cities Network Annual Conference

Our team participated at the WHO European Healthy Cities Network Annual Conference on December 8 with two presentations:

- ❑ The exposome and compliance with physical distancing measures during the COVID-19 pandemic, Cyprus, 2020
- ❑ Exposome changes in primary school children following the wide population non-pharmacological interventions (NPI) implemented due to COVID-19 in Cyprus

You can find more information [here](#).


Exposome




General external domain

Specific external domain

Internal domain

@Home



NPI measures – Changes in exposome of children?

Exposome (2,3)

General external

Specific external

Internal



Publication

Exposome changes in primary school children following the wide population non-pharmacological interventions implemented due to COVID-19 in Cyprus: A national survey

Background

Non-pharmacological interventions (NPI), including lockdowns, have been used to address the COVID-19 pandemic. We describe changes in the environment and lifestyle of school children in Cyprus before the lockdown and during school re-opening, and assess compliance to NPI, using the exposome concept.

Methods

During June 2020, parents completed an online questionnaire about their children's lifestyle/behaviours for two periods; school re-opening (May 21-June 26) following the population-wide lockdown, and the school period before lockdown (before March).

Findings

Responses were received for 1509 children from over 180 primary schools. More than 72% of children complied with most NPI measures; however, only 48% decreased the number of vulnerable contacts at home. Sugary food consumption was higher in the post-lockdown period with 37% and 26% of the children eating sugary items daily and 4–6 times/week, compared to 33% and 19%, respectively, for the pre-lockdown period ($p < 0.001$). Children's physical activity decreased compared to pre-lockdown ($p < 0.001$), while screen time increased in the post-lockdown period, with 25% of children spending 4–7 hours/day in front of screens vs. 10% in the pre-lockdown period ($p < 0.001$). About half of the children washed their hands with soap 4–7 times/day post-lockdown vs. 30% in the pre-lockdown period ($p < 0.001$).

Interpretation

This national survey showed a high degree of compliance to NPI measures among school children. Furthermore, the exposome profile of children may be affected in the months following NPI measures due to alterations in diet, physical activity, sedentary behaviour, and hand hygiene habits.

- ❑ The work was published in the journal "EclinicalMedicine" (<https://doi.org/10.1016/j.eclinm.2021.100721>)
- ❑ Partial funding by the EXPOSOGAS project, H2020 Research and Innovation Programme (Grant #810995)

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