



# iReact-NG

## Reporting

### Project Information

#### iReact-NG

Grant agreement ID: 781616

[Project website](#)

#### DOI

[10.3030/781616](https://doi.org/10.3030/781616)

Project closed

#### EC signature date

19 July 2017

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30 November 2017

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SOCIETAL CHALLENGES - Secure, clean and efficient energy


#### Total cost

€ 71 429,00

#### EU contribution

€ 50 000,00

#### Coordinated by

EMTECH DIASTIMIKI  
MONOPROSOPI ANONYMOS  
ETAIREIA ETAIREIA  
 Greece

## Periodic Reporting for period 1 - iReact-NG (iReact-NG)

Reporting period: 2017-08-01 to 2017-11-30

### Summary of the context and overall objectives of the project



The present feasibility study refers to the iReact-Next Generation P-a-a-S (iReact-NG), for optimized ancillary services in power distribution grids. The study highlights the problem of RES congestion in distribution grids having major impact both on the grid (voltage and network overload costs) and equipment alike as reverse power flows are frequently observed. DSOs incur these costs that subsequently are transferred to end customers. Quality of service resulting from voltage fluctuations

and availability are also factors affected by increased RES penetration due to their dependence to weather conditions. However, increase of RES produced energy is one of the global goals for CO2 emissions reduction, towards a green and sustainable planet.

iReact-NG targets to address the aforementioned issues using the combination of a gateway-controller device (iReact-CG) and a cloud-based backend (iReact-Prognosis) with user-friendly web GUIs. The gateways will be installed in the distributed power generation resources, the backend will continuously find optimized power-flow grid conditions and the results will be applied to RES, so as to tune the set-points of reactive power generation. It will be an intelligent integrated system for distribution system operators, responding in real-time, achieving energy savings, offering quality of service and availability, preventing equipment failures, increase RES penetration, making engineers feel relaxed, in an affordable license-based scheme.

## Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

A Macro-Environmental analysis has been carried-out, following the PESTLE approach. The political factor is highlighted (Paris agreement for reduction of CO2 emissions), thus being highly correlated to anticipated RES penetration increase. Legal factors are of major importance, as they concern regulation framework inefficiencies in distribution grids, which are subject to change in near future, allowing more sophisticated solutions to be applied, towards grid optimized operation.

The study includes a market analysis, referring to key points, such as industry, segments, restraints, customer and total addressable market. Especially regarding segments, via the present study it is evident that the initial focus should target isolated-grids (e.g. islands), and micro-grids; however, in a second phase, non-isolated distribution grids referring to old/outdated infrastructures could be potential adopters of the solution. Additionally, a second iteration regarding product definition and business model has been conducted. Principal concern is the opportunity to offer an affordable and integrated solution to isolated distribution grids, without requesting large customer investments and if possible, to achieve fast ROI for them. Apparently, a monthly recurring license based model, which includes all costs (both software and hardware), apart from telecommunication and system installation, is the most attractive candidate, also able to provide business sustainability and rapid scale in short term.

Furthermore, the study includes a preliminary research regarding IPR and freedom to operate. Although, competitive solutions exist and are already patented, the general concept of RES intelligent management in distribution grids, is considered as prior art, especially due to several academic and governmental institutes publications. However, clear differentiation of the proposed method must be defined and if possible patented.

## Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

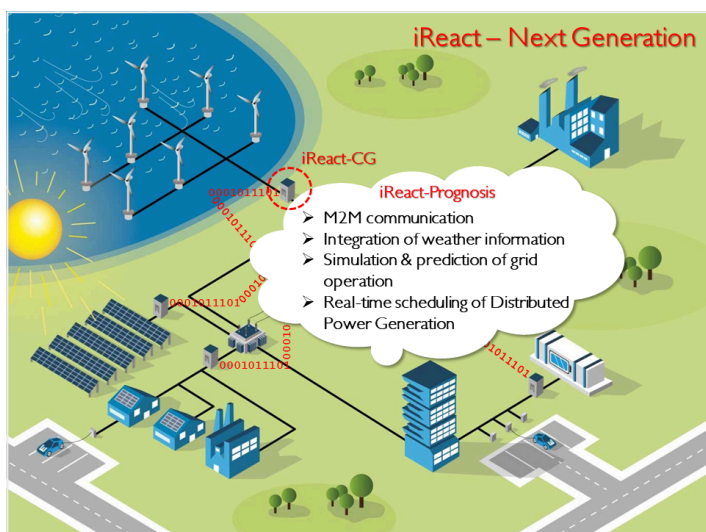
The software backend of the iReact-NG is based on a modular, scalable, and agent-based architecture, providing data abstraction and information fusion of historical, real-time, and future prediction horizons. The latter is provided via a state-of-the-art co-simulation framework, by linking several different simulation environments. The customer experience is centred in the same integrated framework, for designing and evolution planning of the grid, performing high-fidelity simulations (supporting software and hardware-in-the-loop), executing optimized operations, and evaluating potential contingency situations using digital-twin methodologies; all together supporting real-time optimum decisions on grid operations.

The iReact-NG will substantially reduce energy production costs, thermal losses and increase the grid available capacity. It will also give the utilities the ability (distributed control) to effectively control power supply and plan ahead for new RES in order to meet E.U. goals for total energy consumption from renewable energy. iReact-NG will also help geographical islands generate their own sustainable, low-cost energy as energy prices on islands are typically 100% to 400% higher than on the mainland - in accordance with the EU's Clean Energy for EU Islands (more than 2200 inhabited islands) initiative that was launched in May 2017 in Malta.

The company using E.U. funding will acquire new customers that will elevate its positioning amongst the strong competition in the distribution automation market by enhancing some critical success factors as features, brand and distribution network. iReact-NG will use a technology originally developed for space (European Space Agency's - ESA SIMSAT spacecraft simulation infrastructure) in a "down to earth application" like energy distribution, aiding technology transfer and promoting the concept of returning the investment done by European citizens for space activities.

In order for the company to carry out the intended activities, we will need to hire highly trained and skilled personnel for the positions of CFO, CTO, engineering, marketing and sales, production, administration and customer support. Special attention will be given to gender balance by employing at least 50% females.

In conclusion, major project objectives, concept and impact remain unchanged compared to the business plan submitted for Phase 1 and a clear world-wide business opportunity is identified.



The iReact - Next Generation Concept of Operation

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**Permalink:** <https://cordis.europa.eu/project/id/781616/reporting>

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