

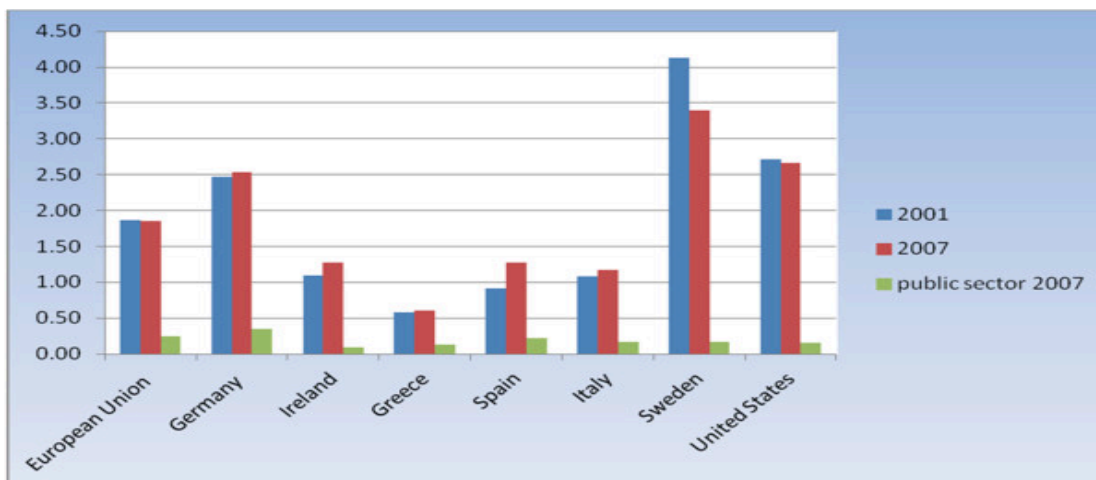
Turning Greece into the European “Silicon Valley” for *Green* Research A Roadmap Proposal

Executive Summary: *Greece’s current institutional reform will bring little economic growth. With an economy based primarily on tourism, trade and agriculture Greece lacks an established competitive industry and an innovation-friendly environment resulting in a low export ratio given the small size of the country and its long-time EU-membership. Instead, Greece exports only its nation’s talents, with low returns. To become prosperous, the country must better leverage its Eurozone membership and add innovative sectors to its economic structure. Given Greece’s hidden assets, such as the beauty of the country, the environmental benefits for green research and activity, the small number of strong research centers and an impressive diaspora in research, tech science, finance and business, we envision a Greek “Silicon Valley” for green research and propose a roadmap to achieve that goal.*

Current issues

- A. Information on investments in research and development (R&D) as a measure of the innovative efforts in the Greek economy (fig.1) reveals that Greece spends only 0.5% of total GDP on R&D activities. In addition, private investments make up less than 0.2% of GDP.

Figure 1: R&D expenditures, percentage of DDP. Source: Eurostat (2012)



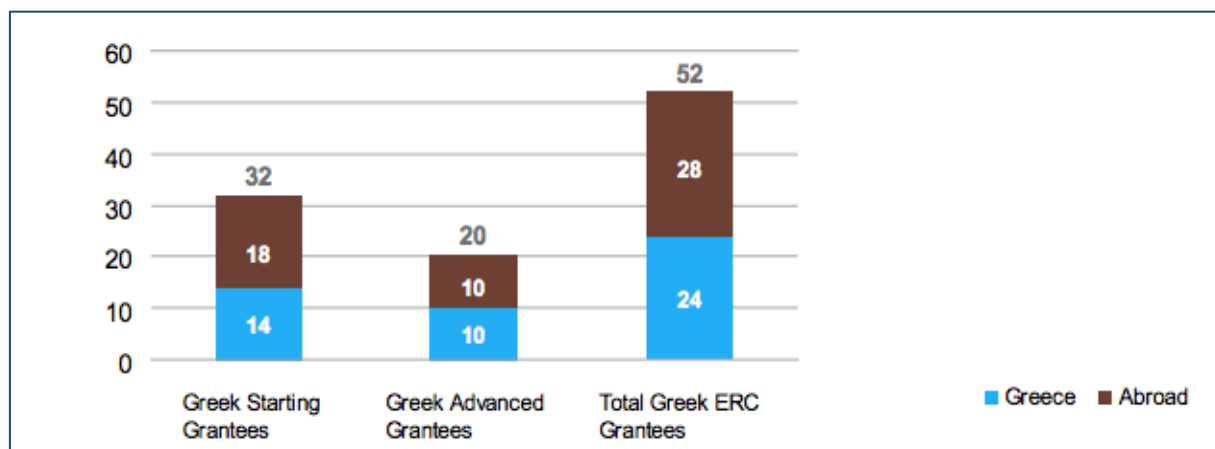
- B. The Greek public research system in its present form is in most parts of recent origin and it is largely with the support of European funding. Unlike public research in more mature innovation systems, it has not co-evolved with industry. Public search is weakly linked to domestic demand, especially for domestic business firms.

- C. Greece's development in green technologies and infrastructures has been limited so far. Greece's own environmental expenditures represent less than 1% of GDP, which is low compared to other OECD countries in a similar development stage.

Hidden assets

#1: The small number of basic research institutes that produce considerable research output. This is substantiated through the number of ERC grants, the most competitive funding scheme in Europe for outstanding researches as a proxy for research excellence. (Figure 2).

Figure 2: Share of Greek ERC grantees in Greece & abroad. Source: Pascual C., Sachini E. (2012)



#2: Estimating the Greek researchers (in Greece and abroad) over the Greek population shows that the ratio of grants to the population is similar to innovation economies (table 1). If this “brain power” could be unleashed within Greece, the country could turn more quickly into an innovative economy.

Table 1: distribution of the ERC grants, home and abroad, and related to population. Source: European Research Council (2012)

	Population in Millions (2011)	ERC Grants home 2007 - 2011	ERC Grants abroad 2007 - 2011	Total ERC Grants (2007 - 2011)	Share over population
Greece	10.5	24	28	52	5.0
Germany	81.8	250	150	400	4.9
Finland	5.4	35	6	41	7.6
Spain	46.1	100	30	130	2.8
France	65.0	240	50	290	4.5
Italy	60.6	145	100	245	4.0
United Kingdom	62.5	310	40	350	5.6

#3: Country's attractiveness in terms of climate and quality of life.

Roadmap proposal

1. Setting a national-level research agenda on eco-innovation research while taking into account the country’s environmental assets.

Greece ranks among the five top EU performers in energy productivity of its economy and in domains related to eco-development (table 2). By placing the research focus on these assets and by creating a clear research agenda will put the country in the center of global attention for green innovative ventures.

Table 2: Greece’s performance on environment-related indicators. Source: (<http://www.greengrowthknowledge.org/country/greece>)

ENVIRONMENTAL AND RESOURCE PRODUCTIVITY		
CO2 emissions per capita (metric tons, 2010)	7.77	
Carbon productivity (GDP per kg of CO2 emissions, 2010)	2.78	
ENVIRONMENTAL QUALITY OF LIFE		
Population exposure to air pollution (PM2.5) (micrograms per cubic meter, 2012)	11.6	
Access to improved sanitation (% of population, 2012)	98.6	
Access to improved water source (% of population, 2012)	99.8	
Access to electricity	N.A.	
NATURAL ASSET BASE		
Average annual deforestation (% change in forest area, 2011)	-0.81	
Annual freshwater withdrawals per capita (cubic meters, 2013)	858.5	
Agricultural land (% of land area, 2012)	63.3	
Terrestrial and marine protected areas (% of total territorial area, 2012)	21.5	

2. The development of multi-disciplinary research institutes and research universities: Given the specialization of the existing research institutes and universities, the research capacities need to be extended with a strong focus on creating spatially bounded knowledge spillover. The European Commission provides in the Research Framework Programme Horizon 2020 two new tools that will help Greece to attract the top of research excellence: “ERA Chairs” and “Teaming excellence”.

3. Expanding research clusters and networks based on existing specialization: It will be important to plan the creation of new research institutes in research areas with a given Greek specialization. Moreover, evidence shows that clusters will be particularly successful in terms of knowledge spillovers when research institutes, universities and innovative companies are geographically concentrated. In this context the Greek government has to rethink the geographical reallocation of its scattered research institutes.

4. Risk Capital for Start-ups: Once knowledge spillovers are turned to new products, it is necessary to close the equity gap of the high-tech start-ups. Access to risk capital will then be one major requirement for a vibrant entrepreneurial culture in Greece.

5. Reform of the education system and strengthening of professional training: Currently new ideas cannot easily make it to the market because practical skills are missing from the Greek labor market. The existing technical colleges in Greece provide the basis to build on a public-private-partnership in education that can lead to significant increases in the quality of professional education at almost zero cost to the public sector. On top of that, the European Centre for the Development of Vocational Training (CEDEFOP) offers unique professional training expertise.

6. Improve regulations for (innovative) enterprises and implement reforms: As a benchmark, Greece should aim to realize *permanent* business registration within one day. To become a fast and efficient public administration, Greece must implement state of the art e-administration for all businesses, (e.g. registering online new businesses, tax declaration, each within one hour).

7. Codification and simplification of legislation: Codification means bringing all amendments to a given law, adopted at different times, into one law. This should include the reduction and unification of the number of administrative procedures relating to any single activity.

9. Start-up Grants: Entrepreneurial activities should be rewarded with grants that cover the basic cost of living during the first six months of start-up. The overall goal of such an instrument is to increase the survival probability of entrepreneurs when their freshly created businesses are still vulnerable.

10. Diaspora policy: Currently, the [Greek Diaspora](#) although very strong, is not treated as an asset to such a policy approach. The Diaspora policy should open interaction and cooperation between those who go abroad and those at home. This could include options for creating

exchange programs for top researchers turning the *brain drain* to *brain circulation* in order to increase knowledge transfers finance R&D, attract risk capital increase management capacities, or even for export promotion of innovative products produced in the homeland toward the Diaspora.

[In conclusion, Greeks need to change how they view themselves, developing from the pre-crisis self-image of an economy based on trade, tourism, and transfers to the vision of an innovative country. However, if Greek authorities commit themselves to the long-term goal of turning Greece into a European Silicon Valley, while communicating to the citizens its long-term benefits, reforms will find political support.]