

EFFECTIVE INDUSTRY-UNIVERSITY RESEARCH

FOR STRATEGIC GOALS AND ECONOMIC ADVANTAGE

Science Foundation Ireland and Science Foundation Arizona



**Presentation By William C. Harris, President & CEO, Science Foundation Arizona
& First Director General of Science Foundation Ireland (2001 – 2006)**

Overview

- **Ireland Foresight Effort**
- **SFI - Strategic Focus & Impact**
- **SFI - Lessons Learned & Replicable**
- **Science Foundation Arizona, SFAz**
- **SFAz - Building for Success & Challenges**
- **SFAz - Model for the needed “intermediary” for university-industry strategic partnerships**



VISION FOR IRELAND

Technology Foresight Effort – 1999



- A Strategic Plan for Ireland's growth as a knowledge-based economy;
- Driven by the Government, in *partnership* with Industry, Higher Education Institutes and society at large;
- Strategy suitable for a small country building on global best practice – and may be a model for US states if replicable;
- Performance had to drive the execution of the strategy to achieve the value needed for economic competitiveness.

Outcome:

Investment plan and commitment to build infrastructure to support growth of the *ICT* and *Biotechnology* sectors in Ireland (2001 – 2015).



GOVERNMENT STRATEGY

- Move Ireland “up value chain” -- create a research *and innovation* driven economy;
- Attract, grow R&D activities within Ireland to advantage industry;
- Broaden the activities of multinational companies in Ireland
- Be supportive of indigenous small companies and start-ups
- ***SFI remains critical to this strategy – complements the IDA and helps achieve added value from the universities***

SFI - IMPACT



- **Grown internationally recognized research capability,**
 - 1990's - below OECD standards
 - 2003 - 36th place
 - 2012 - 20th place
 - 3rd in immunology research
 - 6th in nanotechnology
 - 8th in materials science
- **For every €1 invested and additional €1.4 raised**
- **Over 700 companies linked to SFI funded research groups**
- **In 2012, over 40% of new job announced by IDA in companies with links to SFI**

* *Review early visit to biopharma in Chicago with IDA colleagues.....*

SFI – LESSONS LEARNED

- **Common vision & long term commitment (no flip-flop)**
- **Insure a performance focus – based on first rate research**
- **Drive for best value for each dollar invested**
- **Strong industry/academic linkages essential**
- **Essential to have an intermediary entity & manage for results**
- **Collaborate with all entities to build “Ireland, inc.”**
- **Active Public outreach and dialogue essential (i.e. real partnerships)**





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INNOVATION AT WORK

Is it possible to replicate or adapt SFI to a US state? Can we build an “intermediary” organization to focus on industry-university R&D in Strategic Areas?



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BUILDING ON BEST PRACTICE & LESSONS LEARNED

- SFAz formed 2006
 - Public-Private Partnership (\$105 million to-date in both research & education)
 - Initial State Plan (5 years and \$125M)
 - Development of strong partnerships with industry and our research institutions;
 - Every State Dollar invested is matched
 - Core Operating Costs Paid by CEO Groups for the initial 5 years
 - Flagstaff 40 (including City of Flagstaff), Greater Phoenix Leadership, Southern Arizona Leadership Council
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SCIENCE FOUNDATION ARIZONA

Strong Commitment & Guidance from SFAz Board:

- **Donald Budinger**, Chairman, SFAz; Founder and Past President, Rodel Foundations
- **Craig Barrett**, Vice Chairman, SFAz; Chairman of the Board, Intel Corporation
- **William Harris**, President and CEO, Science Foundation Arizona
- **Fred Boice**, Former member of the Arizona Board of Regents
- **Jaime Casap**, International Education Evangelist, Google
- **Anita Jones**, Professor, Univ. of Virginia; Former Director of Defense Research, US Dept. of Defense
- **Ira Levin**, Former Senior Deputy Director, National Institutes of Health
- **Mara Aspinall**, President & CEO, Ventana Medical Systems
- **Robert Millis**, Former Director, Arizona Lowell Observatory
- **Lisa Graham Keegan**, Former Superintendent of Public Instruction, State of Arizona
- **Carl Wieman**, 2001 Nobel Prize Laureate-Physics; Professor, Stanford University
- **Martina Newell-McGloughlin**, Director, Biotechnology Research, University of California at Davis
- **Alastair Glass**, Former Vice President, Bell Labs Photonics; Chairman, Tyndall Institute

CRITICAL TO SUCCESS - ACCOUNTABILITY & EXPERT REVIEW PROCESS

- **Invest to create a competitive advantage for Arizona;**
- **Expert reviews on research and education;**
 - Provided by out of state experts to avoid conflict of interest;
 - Excellence of idea and of researcher is first step (like NSF);
 - Creating a competitive advantage for Arizona is the bottom line.
- **Funding is linked to performance/achievement;**
 - If grant recipient does not perform: SFAz terminates funding;
 - Termination of a grant support is the *best* incentive for performance;
 - Board members drive this focus: Results & Performance



SFAz IMPACT (2006 - 2012)

The ROI of \$68m in research over 6 years has been analyzed by an independent outside firm, BATELLE, and key elements of the report are:

- **105** strategic research grants across Arizona's research ecosystem
- Grants have leveraged nearly an additional **\$600M** and on State Funds alone, a return of **\$4.83 for every \$1 contributed**
- Launch of **24** companies, majority in last 3 years
- **207** patents & **23** cumulative technology licenses in place
- **1,865** jobs related to cumulative grant activity
- **11** Bisgrove Post doctoral Scholars + 5 to be named in March 2014
- **297** Graduate Research Fellows – impact on K-12

Reference: SFAz's Battelle Report 2013

SUMMARY – LESSONS LEARNED

- SFI /SFAz model is replicable – a model “INTERMEDIARY” organization
 - High quality Board essential – 30 to 50% must be out of state to avoid politics or a distribution by a formula.
 - Must have bi-partisan support – to avoid “flip flop”.
 - SFAz illustrates great value that can be created by public – private partnership
 - The “intermediary” entity greatly increases the return on R&D expenditures and advantages industry. Examples:
 - **Mining – MRI** at the University of Arizona and the impact
 - **Heliae** – now over 120 employees with average salary more than \$75K
 - **DERM – SPECTRA** start up
 - SFAz demonstrates intermediary value; problems with “flip flop”; need for state/local government commitment
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