

Driving Technology Diffusion Commercially

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GE Works

GE works on things that matter. The best people and the best technologies taking on the toughest challenges. Finding solutions in energy, health and home, transportation and finance. Building, powering, moving and curing the world. Not just imagining. Doing. GE Works.



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MANAGEMENT



OIL &
GAS



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WATER



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AVIATION



TRANSPORTATION



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Advanced Manufacturing and Software Technology Center
Detroit, MI



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Niskayuna, NY



Global Research Europe
Munich, Germany
2X Size + Customer Innovation Center



Software CoE
San Ramon, CA



O&G Tech Center
Oklahoma



Israel



Welch Technology Center
Bangalore, India



China Technology Center
Shanghai, China
+ 3 Customer Innovation Centers



Russia



Japan



Brazil Technology Center
Customer focused R&D
Rio de Janeiro, Brazil

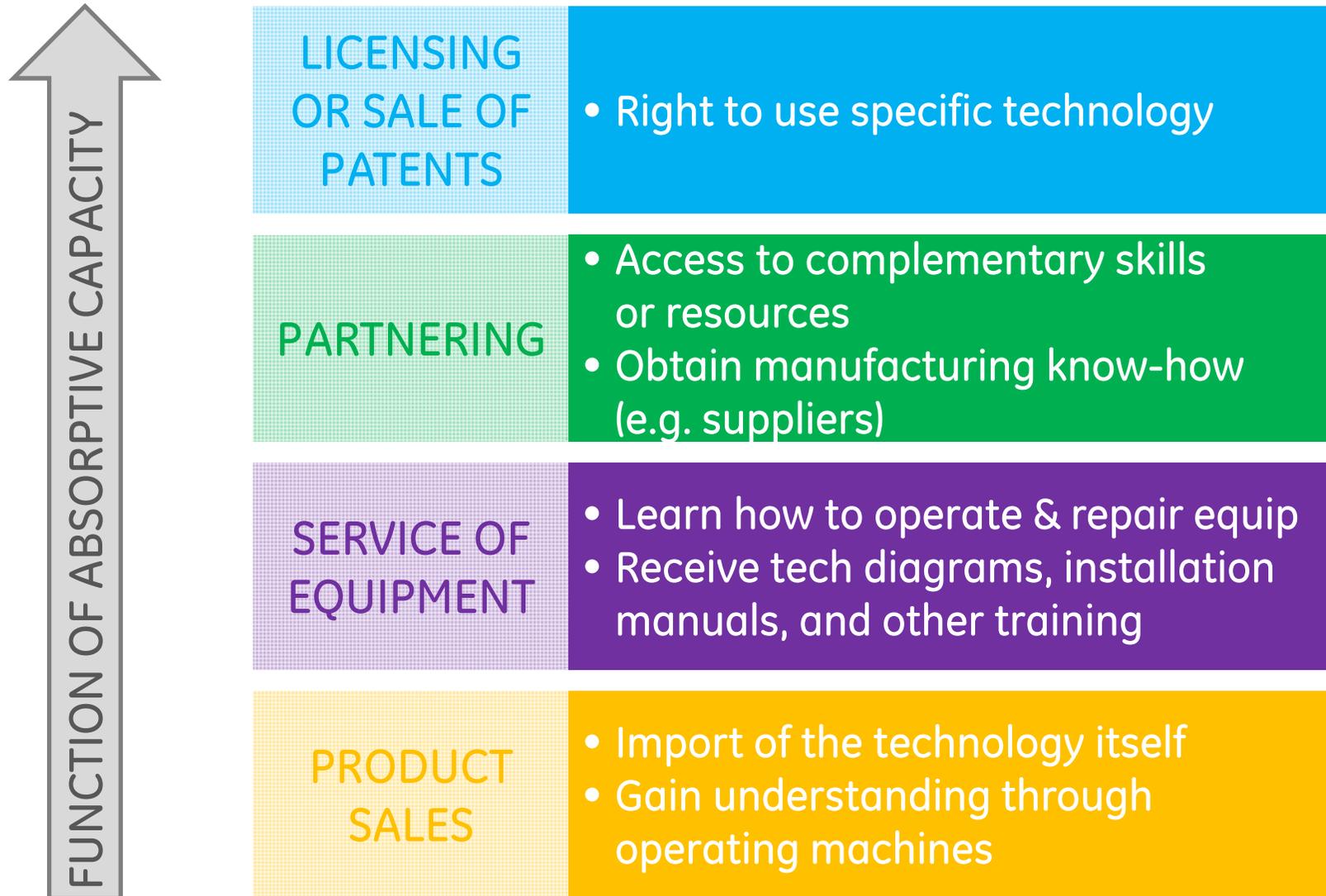


Technology diffusion – in the sense of technologies being adopted locally, know-how being shared, and the local population and workforce using and learning how to use new and innovative technologies – is not something that occurs overnight or that can be forced upon participants.

SOURCE: Energy Sector Environmental Innovation. WEC 2011

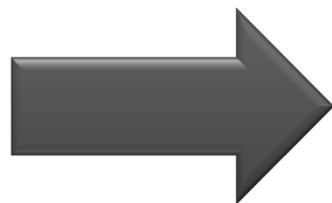


A few examples of how technology can diffuse



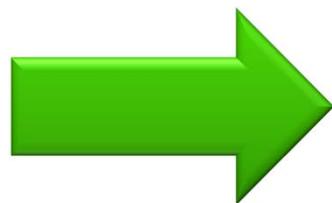
Why partnerships are more effective

A patent
license
provides



RIGHTS
TO USE A
PATENT

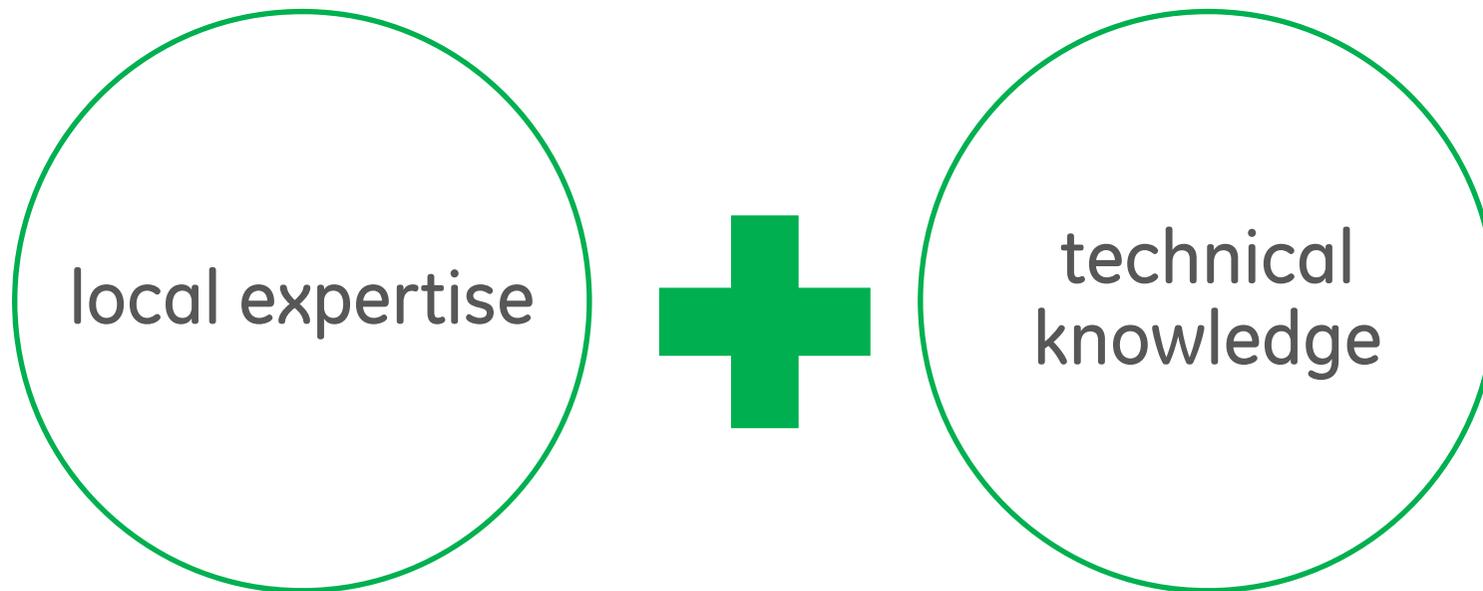
Partnerships
enable



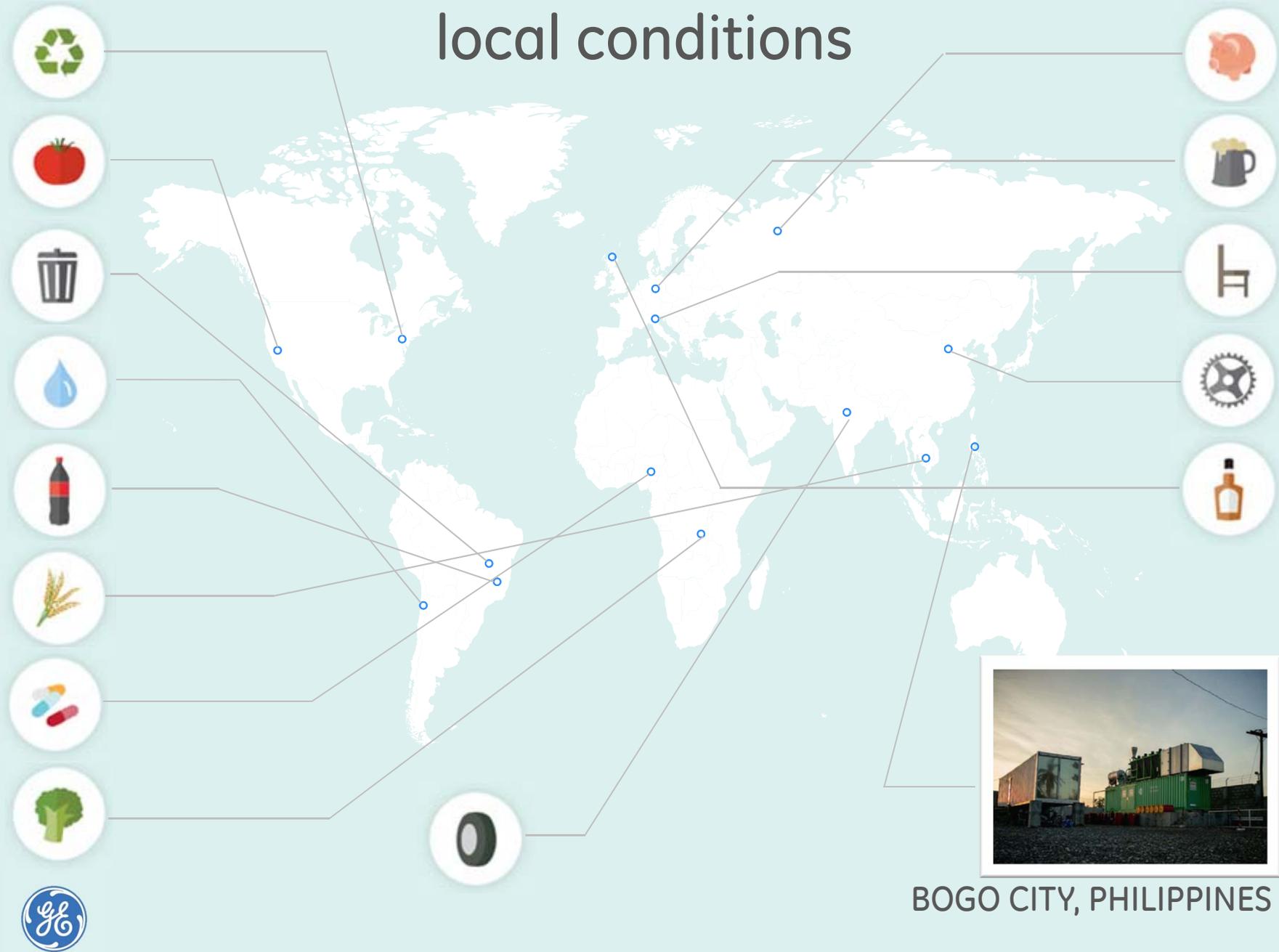
RIGHTS
TO USE A
PATENT
ACCESS TO
KNOW-HOW



accelerating the diffusion of technology requires



Jenbacher: Power built on and for local conditions



BOGO CITY, PHILIPPINES

Local partnership to build capacity

By establishing a local subsidiary (GE South African Technologies Limited) and developing a partnership with Transnet Rail Engineering, a state-owned South African company, we are able assemble our state of the art locomotives locally.



SOURCES: GE NEWSCENTER & GE REPORTS



ENVIRONMENTAL BENEFITS

3 locomotives replace 4 older ones
reducing fuel consumption by over
500,000 liters and reducing 1500 metric
tons of CO₂ annually



CAPACITY BENEFITS

“Benefits include job creation here in
South Africa, skills and technology
transfer and the renewal...”
-Paul Nkuna, CEO of MIC

“The partnership is a natural step along
the path of localizing our capabilities...
We’re investing...because we want to
participate in the social and economic
transformation of the country.
-Lorenzo Simonelli,
President & CEO of GE Transportation

Power Africa Off-Grid Energy Challenge



Seek innovative off-grid solutions to “power up” rural Nigeria and Kenya



stand alone cold storage for farmers store products



18 kW solar powered mini-grid to reach 140 homes



2.5 MW of electricity hydro-electric power system



(EA) Ltd.
Leaders in Solar Technology

construct 5 solar powered water points



construction of a bio-digester to produce electricity and biogas

MIBAWA SUPPLIERS

distribute rent to own IndiGo lights to replace kerosene lamps

Helps find new partners

Clear contribution to partnership

Reviewing patent literature can uncover parties having complementary solutions or synergies

Identifies what each party brings to the venture and what is new

IP drives & supports partnerships

Predictable IPR encourages sharing

Provides a construct to build on success

Enables disclosure of trade secrets to speed up and enhance innovation

New inventions can be patented to be exported, licensed, etc.



Case Studies
*How IP facilitates
technology handoffs*

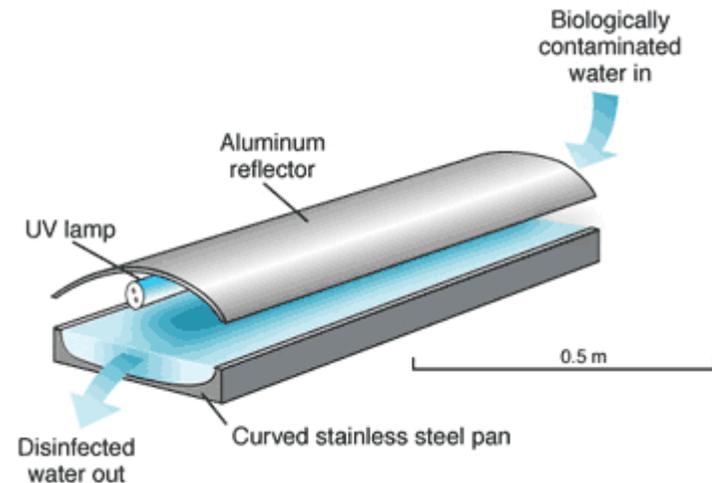


UV Waterworks: Community Scale Water Purification

- invented by Dr. Ashok Gadgil,
@ Lawrence Berkeley National Laboratory
- patented and exclusively licensed to

waterhealth

- low cost technology, with communities investing less than USD\$10/person to get drinking water exceeding WHO quality stds
- the solution is deployed in India, Philippines, Sri Lanka, Ghana, Nigeria, and Liberia



UV Waterworks: initial business model concept

plug and play

communities would buy a unit, take it home, and “plug it in”



the reality

it doesn't work if there is no socket, no reliable power, or related infrastructure

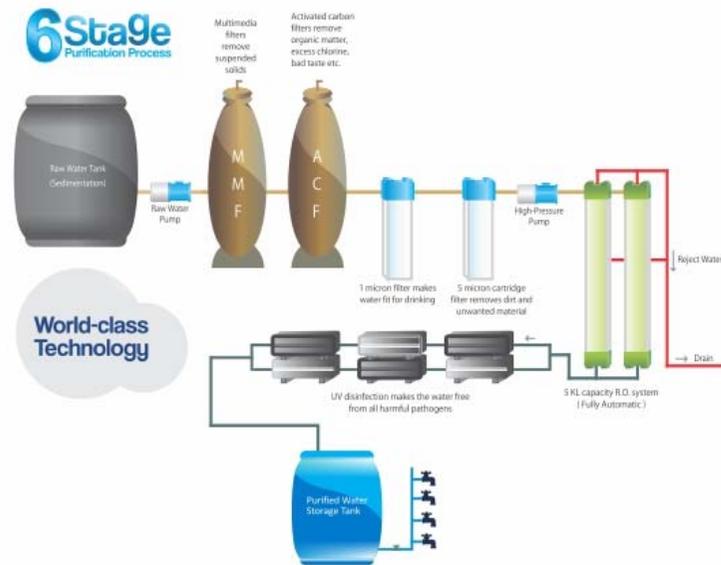
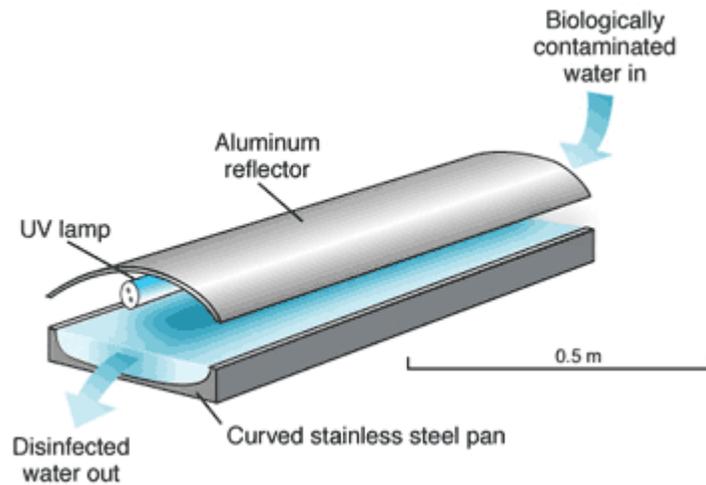


The Introduction of WaterHealth Centers

- WaterHealth International constructs modular centers (construction time in 20 days)
- Serves up to 6,000 people/day
- WaterHealth provides staffing, water testing, and maintenance
- leads to local jobs, and income generation for the community



The path to viability can be a long process

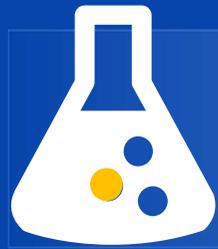


World-class Technology



SOURCES: Science and Public Policy (2012)39 (6): 775-786, WaterHealth International

Turning ideas into solutions



basic
research



breakthrough



applied
research



iterate
& refine



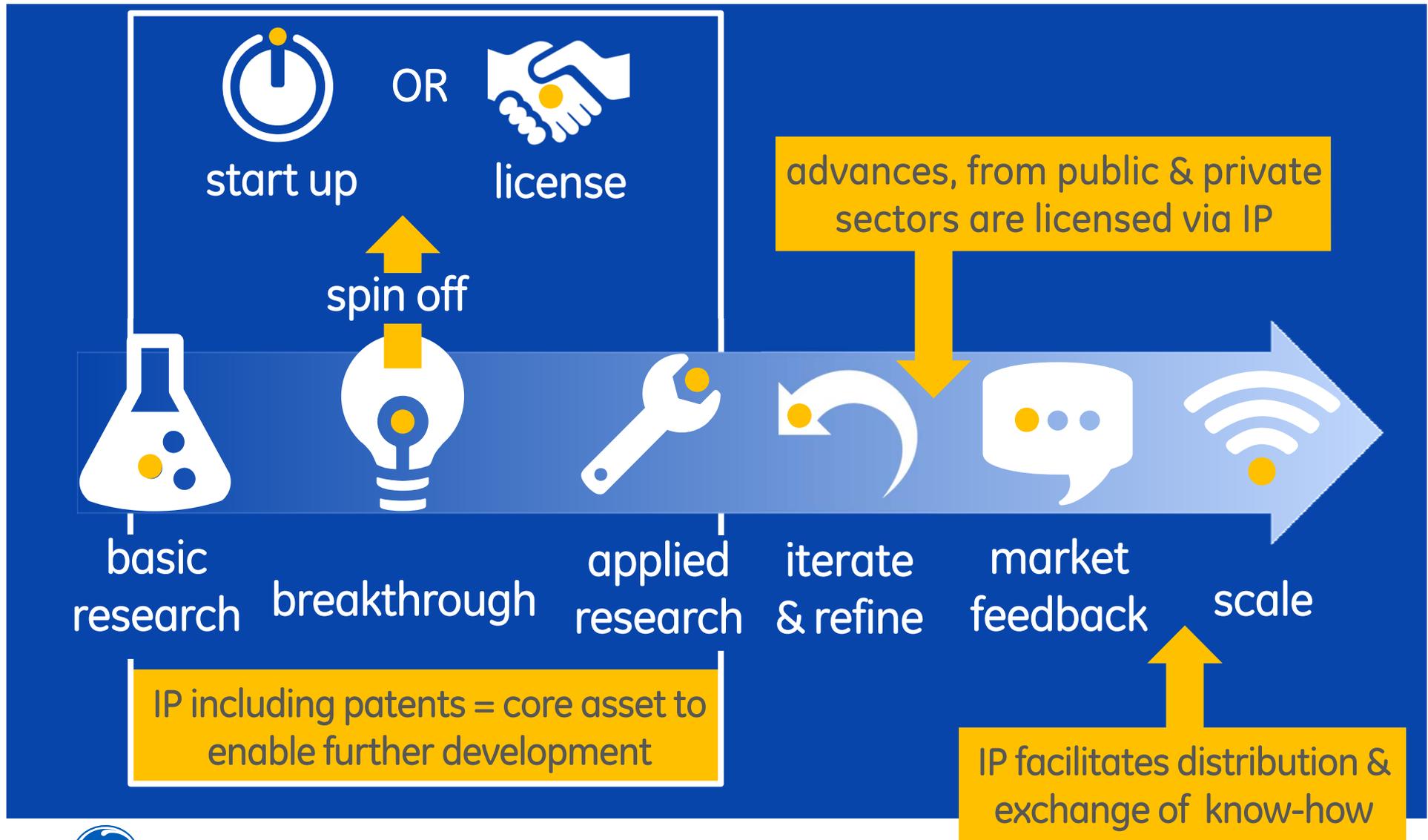
market
feedback



scale



How can IP facilitate the scaling of solutions



IP handoffs enable
continued solar
development



What steps can we take, **together**, to accelerate the **transfer & diffusion** of technology?



Factors than can make diffusion challenging

low levels of investor confidence

Driven by weak institutional memories, lack of operating processes and stable legal regimes

shortage of technical skills

Can suppliers build the parts you need? Can the local work force manufacture, operate & service offerings? Are local institutions building the right capabilities?

(often unintended) policy barriers

Do policies and other requirements match the current realities of the market?



GE Kujenga: a framework for diffusion

EMPOWER people with valuable skills

- leadership programs (technical, comm., ops, finance, etc.)
- invest in local institutions to build a pipeline
- develop suppliers

EQUIP communities with new tools and technology

- offerings that are adapted for local conditions
- build and develop infrastructure

ELEVATE ideas, lending them scale & resources to transform

- find local partners
- identify and help scale ideas that will help solve local challenges



