protos

B/S/H/

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# Protos The Plant-Oil Cooker: Overcoming Challenges

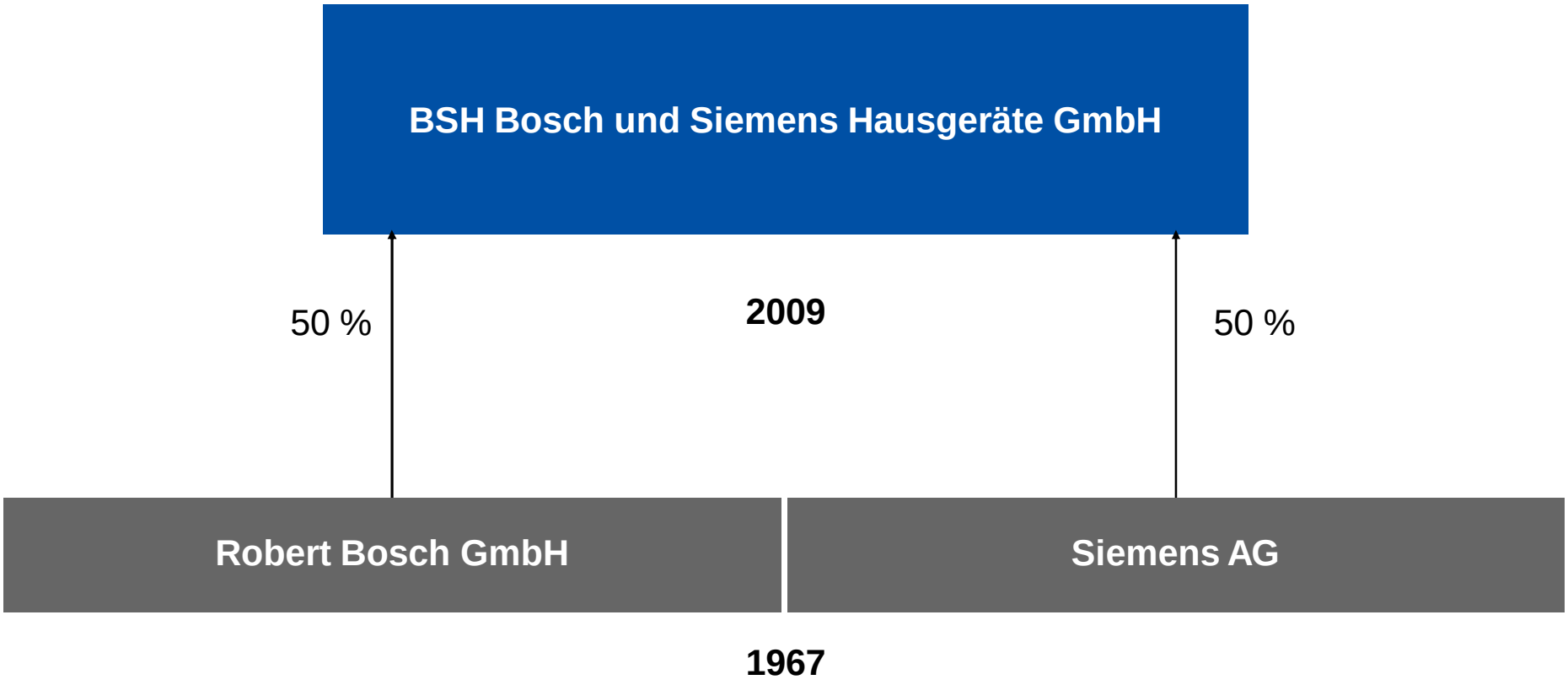
**In Abseitz der Netze**
**Bonn, January 10, 2011**

**Samuel Shiroff**

# Agenda

- **BSH Overview**
- **The Overall Problem and BSH's Solution**
- **Technology Development**
- **Business Model and Economics**

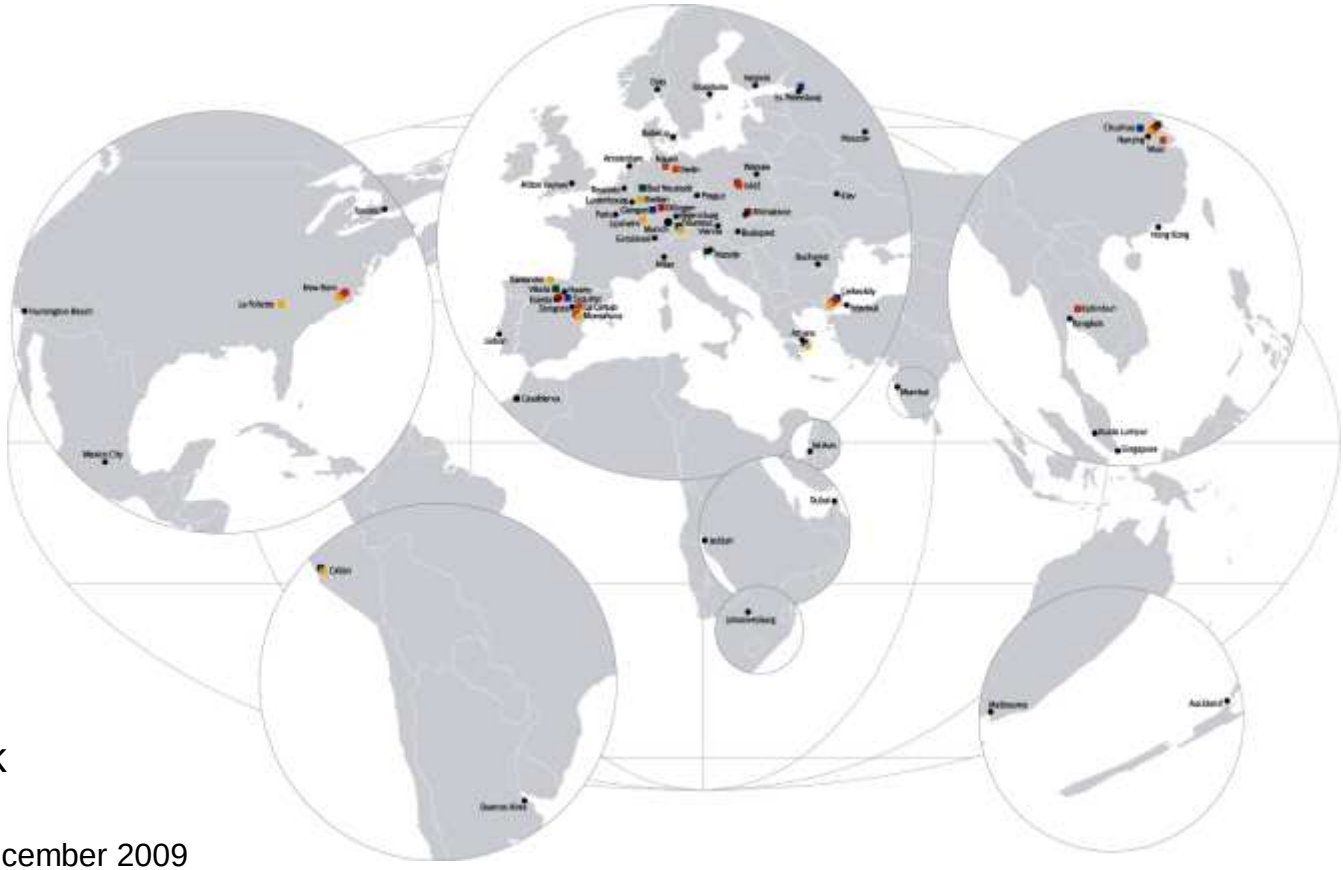
# The BSH Shareholders



# B/S/H/

## BSH – in a nutshell

- 12 brands*
- ~ 40,000 employees worldwide**
- 8.4 bill. EUR sales**
- > 60 companies in over 40 countries*
- 41 factories in Europe, the USA, Latin America and in Asia*
- Global sales and customer service network



*Valid at: May 2010 **Valid at: 31 December 2009

## Content

- BSH Overview
- **The Overall Problem and BSH's Solution**
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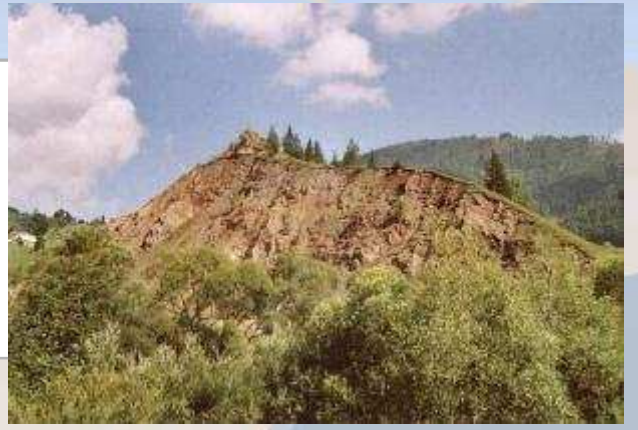
# The Overall Problem and BSH's Solution

**Traditional Cooking**

## Deforestation

- Ecological problems
- Unreliable energy supply
- Rwanda: 3.000 km forest, 150 km² deforestation p. a.



## Wood Supply

- Collection
  - Time consuming
  - Health damaging
- Expensive purchase

## Open Fire Cooking

- Low efficiency (5-10%)
- Hazardous emissions:
  - Lung infections, Cancer
  - 1,6 Mio. deaths p.a.

# The Overall Problem and BSH's Solution

**Why not to cook with a Plant Oil Stove?**

**Oil Plants**
- **Large-scale production**
- **Small-scale production**
- **Plantation and marginal lands and degraded soils**

**Plant Oils**
- **Sustainable energy supply**
- **Local production**
- **CO2 neutral**

**BSH is using its core competency to create a clean and reliable cooking technology for 'non-traditional' customers**

# The Overall Problem and BSH's Solution

## Protos – The World's First Plant Oil Stove

- **Power range:** **2.0 – 2.5 kW**
- **Usage:** **2 – 4 liters oil per week**
- **Fuel:** **All plant oils, also used oils**
- **Efficiency:** **45 – 58 %**
- **Emissions:** **Ten times lower than kerosene**
- **CO2-balance:** **Neutral**


**Protos Advantages :**
- More powerful stove
- Uses renewable energy
- Environmentally friendly
- Healthy for the user
- Local added value & job creation

# Agenda

- BSH Overview
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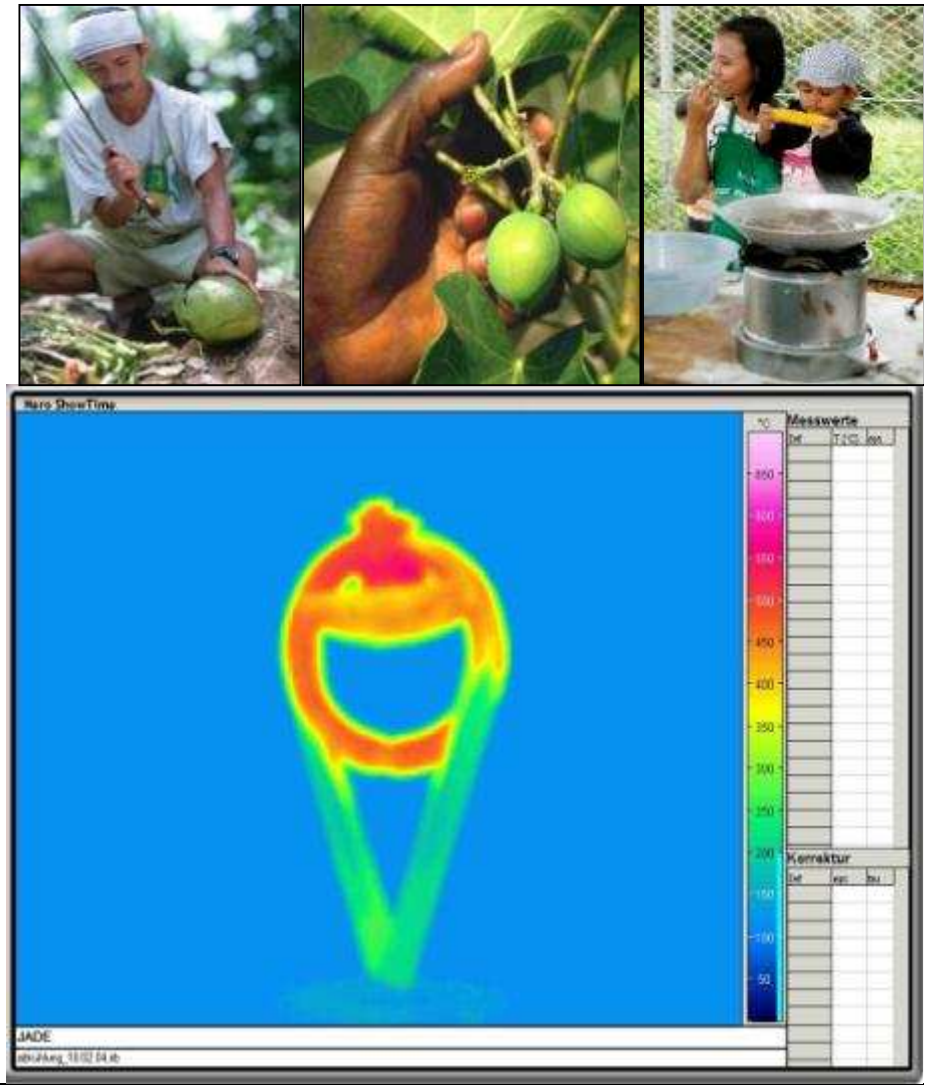
# Protos Technical Challenges

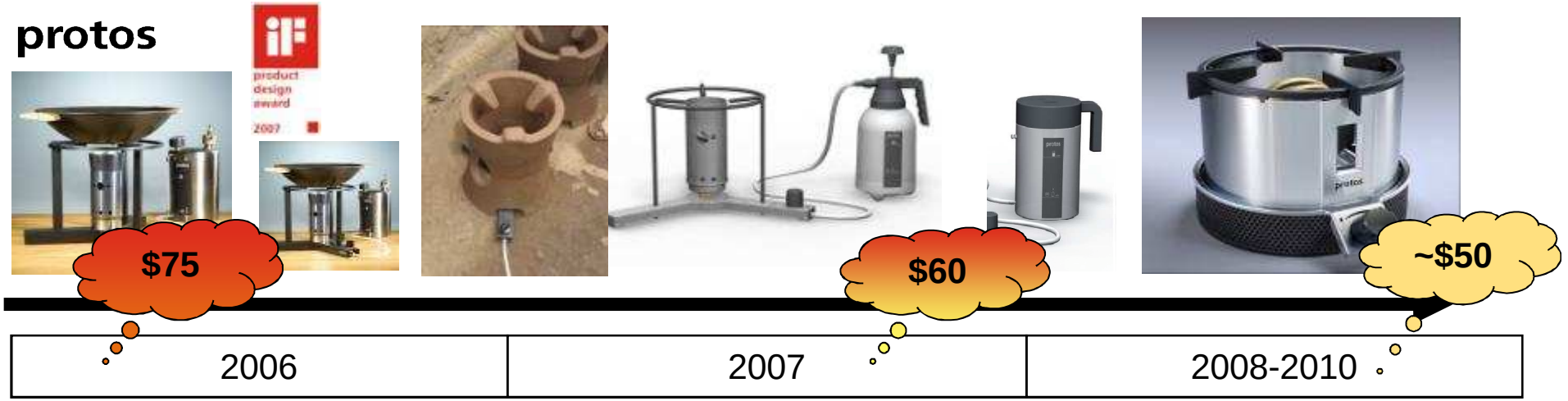
## Creating a Universal Plant Oil Cooker

- Plant oils differ dramatically between species in their physical properties
- Non-transesterified plant oils leave significant residue when burned
- Plant oils have very high flash-point
- Stove must be both functional and low cost
- Must be suited to target-market needs



## Protos Technical Challenges

**Product development: Significant time and mulitple iterations to optimize cost and functionality**

# Agenda

- BSH Overview
- Protos: A more efficient way to cook
- Technology Development
- **Business Model and Economics**

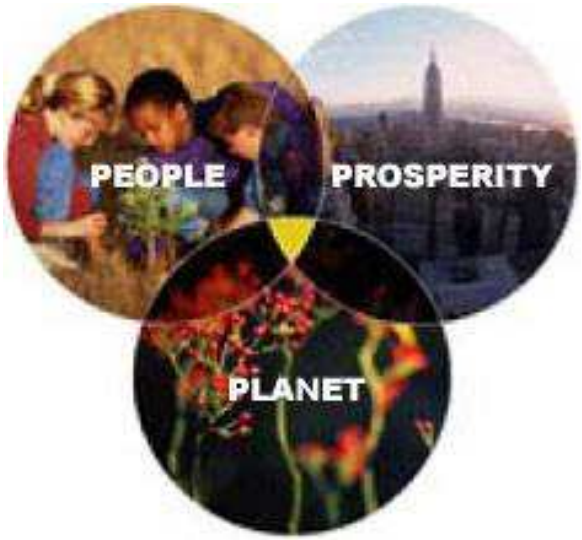
# Establishing our Principles

## How BSH Understands Protos

- Protos is an internal learning tool
- Run on the principles of a social enterprise
- BSH primary added value is reputational
- Local partners expected to make a profit

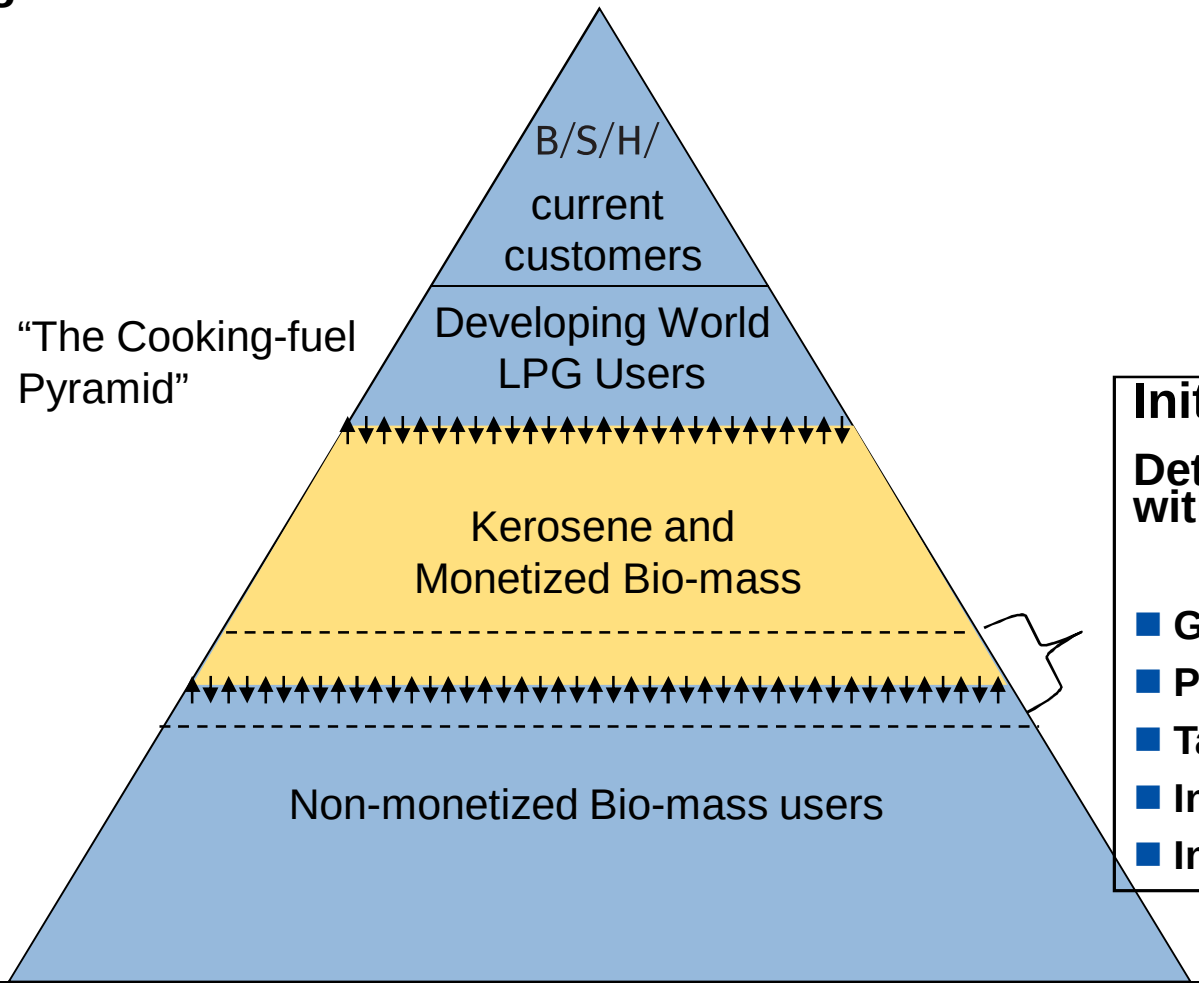

## Project Goals

- Economic goal = cost coverage
- Ensure overall environmental, social and economic sustainability
- Create local added value and jobs
- Technology transfer
- Foster North-South / South-North / South-South dialogue



## Establishing the Target Market

**Target market: who and where are our users?**



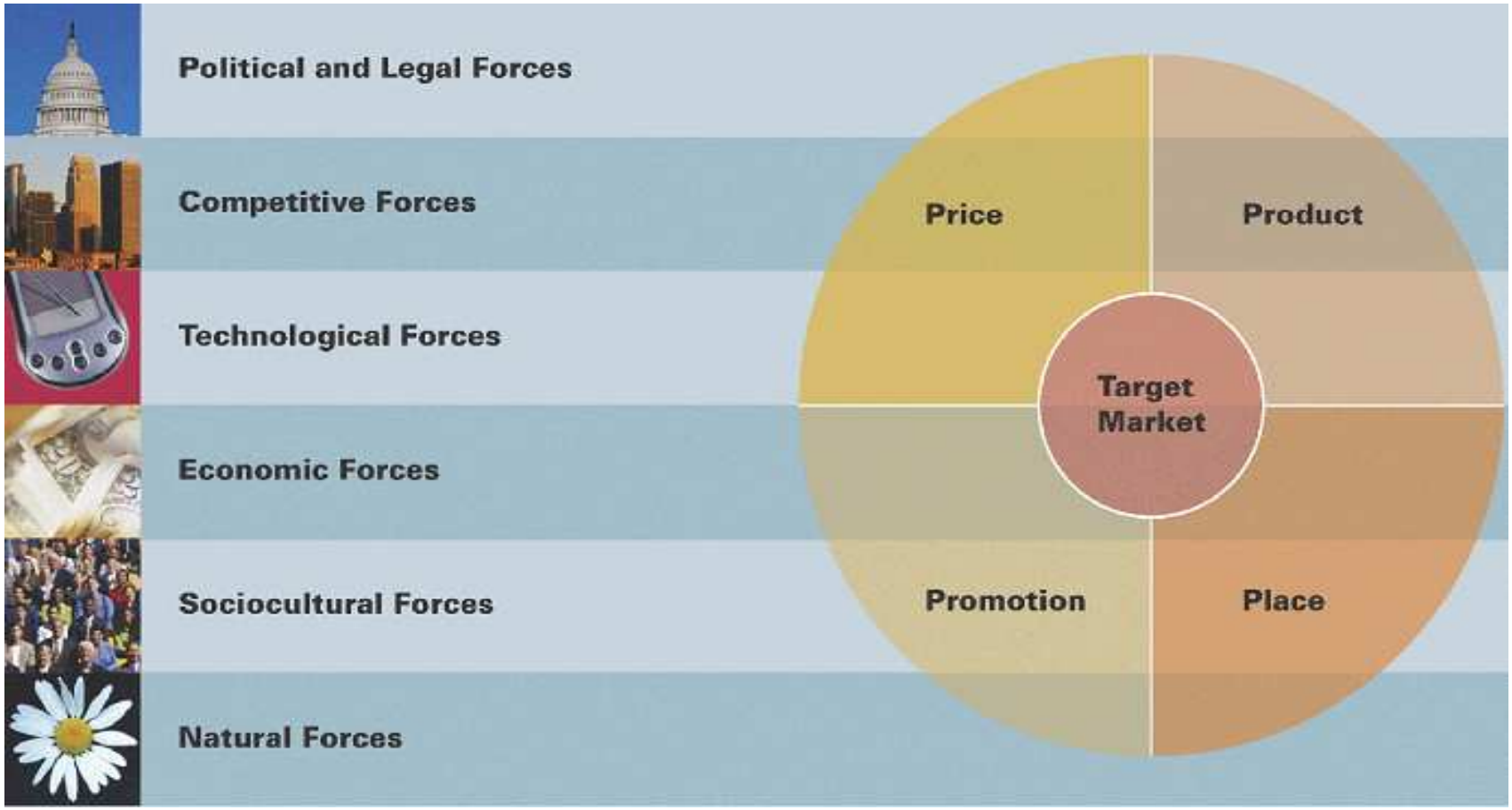

"The Cooking-fuel Pyramid"

**Initial Market Focus**

**Determined via field tests with ~1000 families in:**

| | Test Start |
|---|---|
| ■ Guatemala | 1999 |
| ■ Philippines | 2003 |
| ■ Tanzania | 2005 |
| ■ India | 2007 → |
| ■ Indonesia | 2007 → |

## Understanding the Marketing Strategy and Environmental Forces



## Assembling the Right Team: Cooperation Partners

UNIVERSITÄT HOHENHEIM

euronatur

der Bundeswehr Universität München

Bellagio Forum for Sustainable Development

Germany Land of Ideas

DEG KFW BANKENGRUPPE

gtz Partner für Perspektiven. Weltweit.

Universität Stuttgart

Universität Karlsruhe (TH)
Forschungsuniversität • gegründet 1825

DBU Deutsche Bundesstiftung Umwelt
Wir fördern Innovationen!

TJOKRO GROUP
TOTAL SERVICE FOR YOU

# Developing Business Models

## Cost of the Cooker

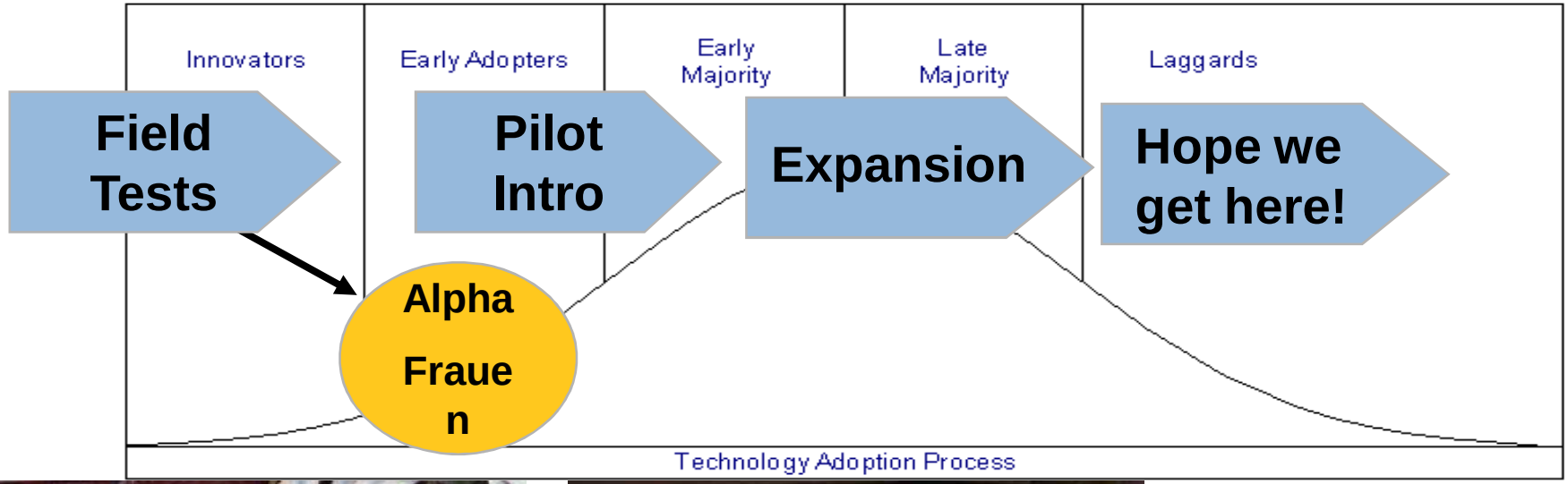
- Production cost ~ $50 (includes tank)
  Transport +
  Training +
  Warranty +
- Sales price ~ $20
- Cost gap ~ $30+++


## 3 Business Models

| Traditional Model | | Builder Model | | CO2 Model | |
|---|---|---|---|---|---|
| Cooker Price | ~$50 ExW + | Cooker Price | ~$50 ExW + | Cooker Price | ~$50 ExW+ |
| | | Builder Subsidy | - $xx | CO2 Project Cost | $xx + |
| | | | | CO2 Revenue | -$yy |
| Total User Cost: | **$50+++** | Total User Cost: | **<$50** | Total User Cost: | **<<55** |
| Customers | | Customers | | Customers | |
| end-users willing/able to pay | | Government | | CO2 Project Developers | |
| | | Plantations | | CSR | |
| | | Charitable Organizations | | Energy Companies | |
| | | CSR | | | |

overlaps

## Technology Adoption Process




## Status and Accomplishments

- **Distribution begun and Growing In Primary Market: Indonesia**
  - Serial production underway
  - 1500 Units Sold
  - Distribution system in place in 3 locations
  - Planned 7000 units in 2011 (more possible)
- **Expansion in further markets underway**
  - India
  - Philippines
  - Ethiopia
  - Kenya
- **Technology Transfer On-Going**
  - North-South / South-North / South-South
  - Technology improvements in pipeline
- **Innovative Business Models Developed**
- **Added Value for BSH**

**Thank You!**
**More Details Tomorrow at 9:30**

# Agenda

- **Back Ups**

# Protos: Innovative Business Models

Services

Warm Food, Safe Fuel, Faster, Low Cost

Environmental

Health / MDGs

Cost Gap

Payment

**Individuals paying for:**

Kerosene
Charcoal
Wood

Reduced Deforestation
CO2 Neutral Fuel

CERs / VERs

Payment

Companies

Governments

CDM

**Reduce Costs:**
Scale,
Technical
Development

Grants

Who cares

Maternal Health
Child Health

B/S/H/

Value

WHO / UN

IGOs/ NGOs

General Public

Foundations

Development Orgs

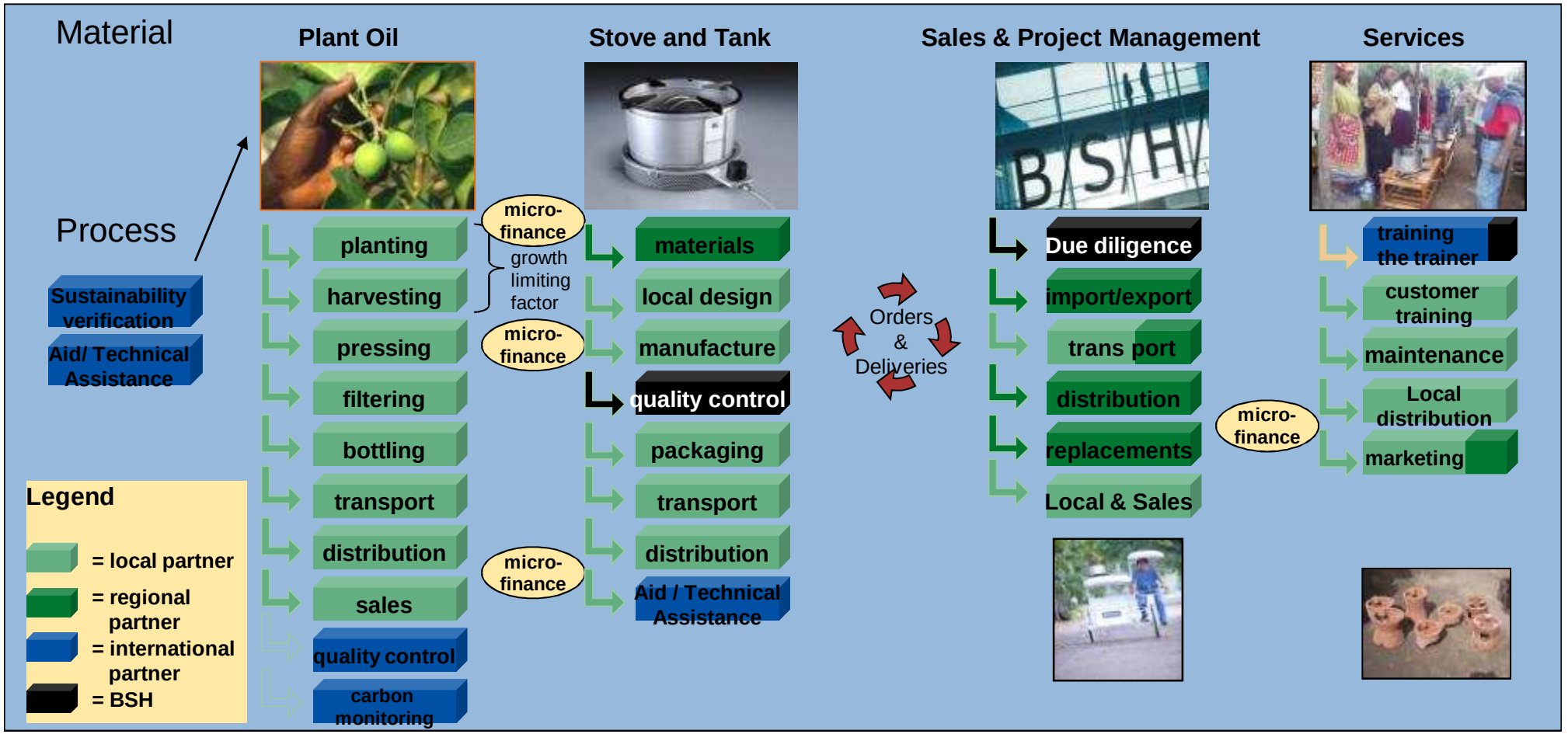
Reputation / Brand

Political

Operational

# Protos Business Model Challenges

## Local Added Value With Sustainability Checks



## Ensuring Sustainability: Plant Oil Comparisons

| Type of Plant Oil | Liters /ha/yr | Land required for 100l/yr | Comments |
|---|---|---|---|
| **Used Oil** | n/a | n/a | Filter and burn - low cost |
| **Cotton Seed** | 325 | 3077 $m^2$ | By product of cotton |
| **Castor** | 1413 | 707 $m^2$ | Crop every 5 months |
| **Jatropha** | 1892 | 528 $m^2$ | Grows on marginal land |
| **Coconut** | 2689 | 372 $m^2$ | Only when distance to markets too great |
| **Palm oil** | 5950 | 168 $m^2$ | Not currently used in Protos |


**BSH Focus:**

| Non-edible Oils | Used oils | By-Products |
|---|---|---|
| Jatropha oil | Mc Donalds | Cotton seed oil |
| Castor oil | Hotel Chains | Kapok seed oil |
| Babassu oil | Small business | |
| Neem oil | | |

**→ No competition to food production!**

## … and Beyond

### Estimate of Potential Protos Users Other Markets

**Assessment Criteria:**

**Oil availability & accessible target market**

- **Indonesia** **> 1.5 million**
- **India:** **> 1 million**
- **Philippines:** **>100,000**
- **South Africa:** **>100,000**
- **Ghana:** **>100,000**
- **Tanzania:** **>50,000**
- **Haiti / DR:** **>50,000**

**Total = ~3 million stoves***

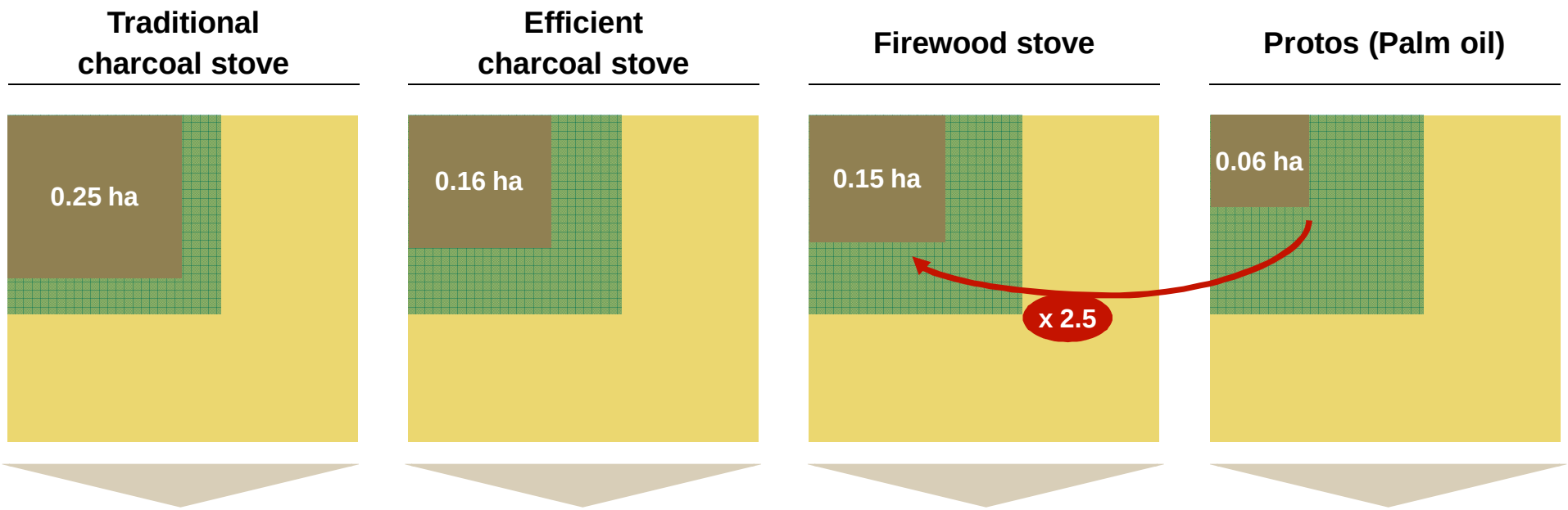
*only if plant oil sustainability criteria can be met

# Protos Technical Challenges

## Local Production

## OEM manufacturer Tjokro (Indonesia)

- Production capacity: 50.000units/year
- 25+ local jobs created
- Technology transfer
- Two-way learning process to improve product and lower costs




Assumptions for nutrition performance: (2,500 cal per capita per day) x (average family size of 4.3) x (365) / (3,600 cal / kg of corn) / (corn yield of 3 tons / hectare / year) = 0.4 hectares / family
Assumption for all wood based fuels is sustainable forestry