



Business Models for Implementation

Financial mechanisms recommended and available for implementation of LEDS, including climate finance structures, IFI, multilateral banks, green banks and bonds

Agenda

Review & Discuss

Key Challenges

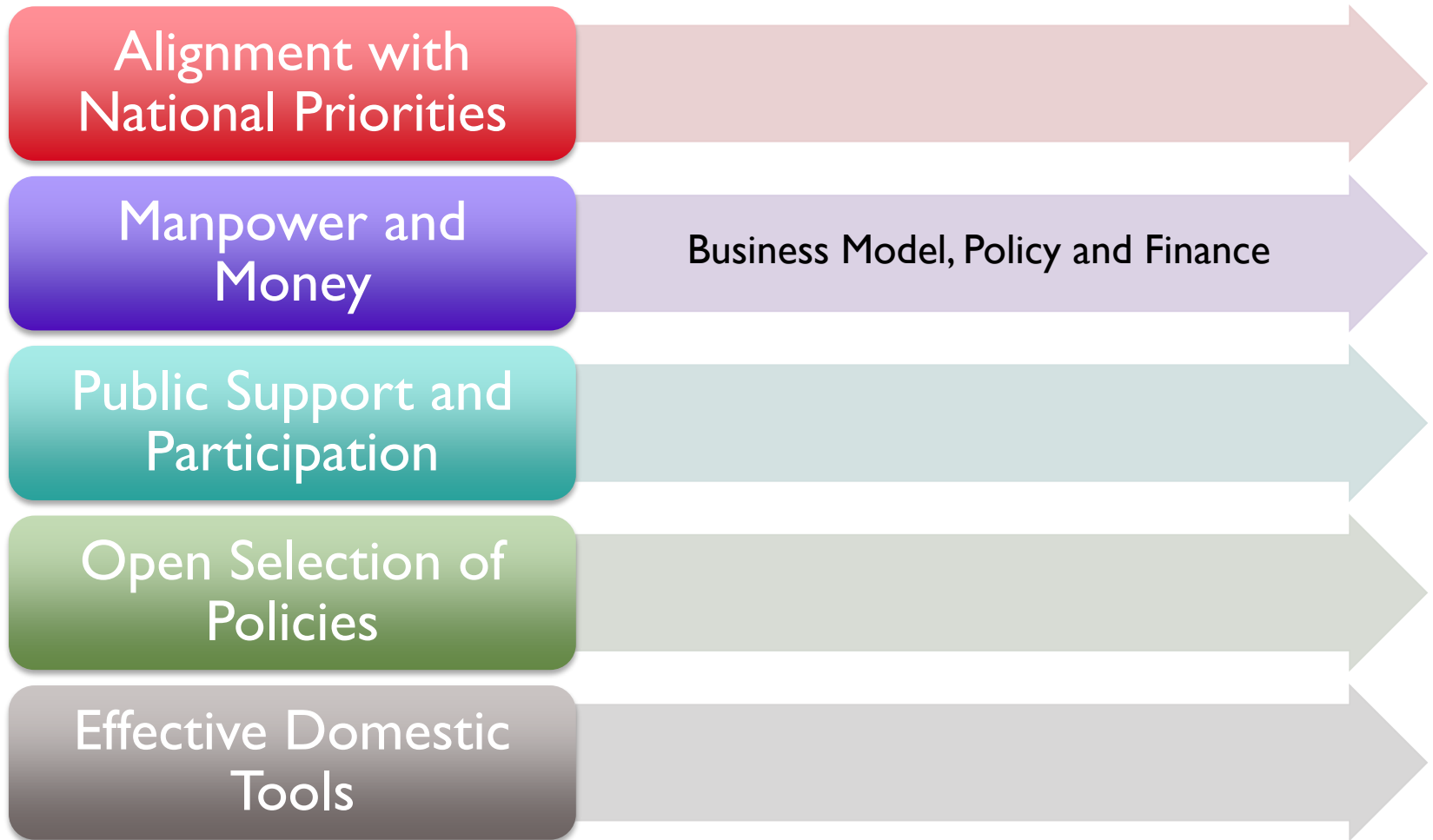
Success Models

Donor Requirements

Case Example

Next Steps

LEDS/NDC Goal Implementation



Future Sources of Funds

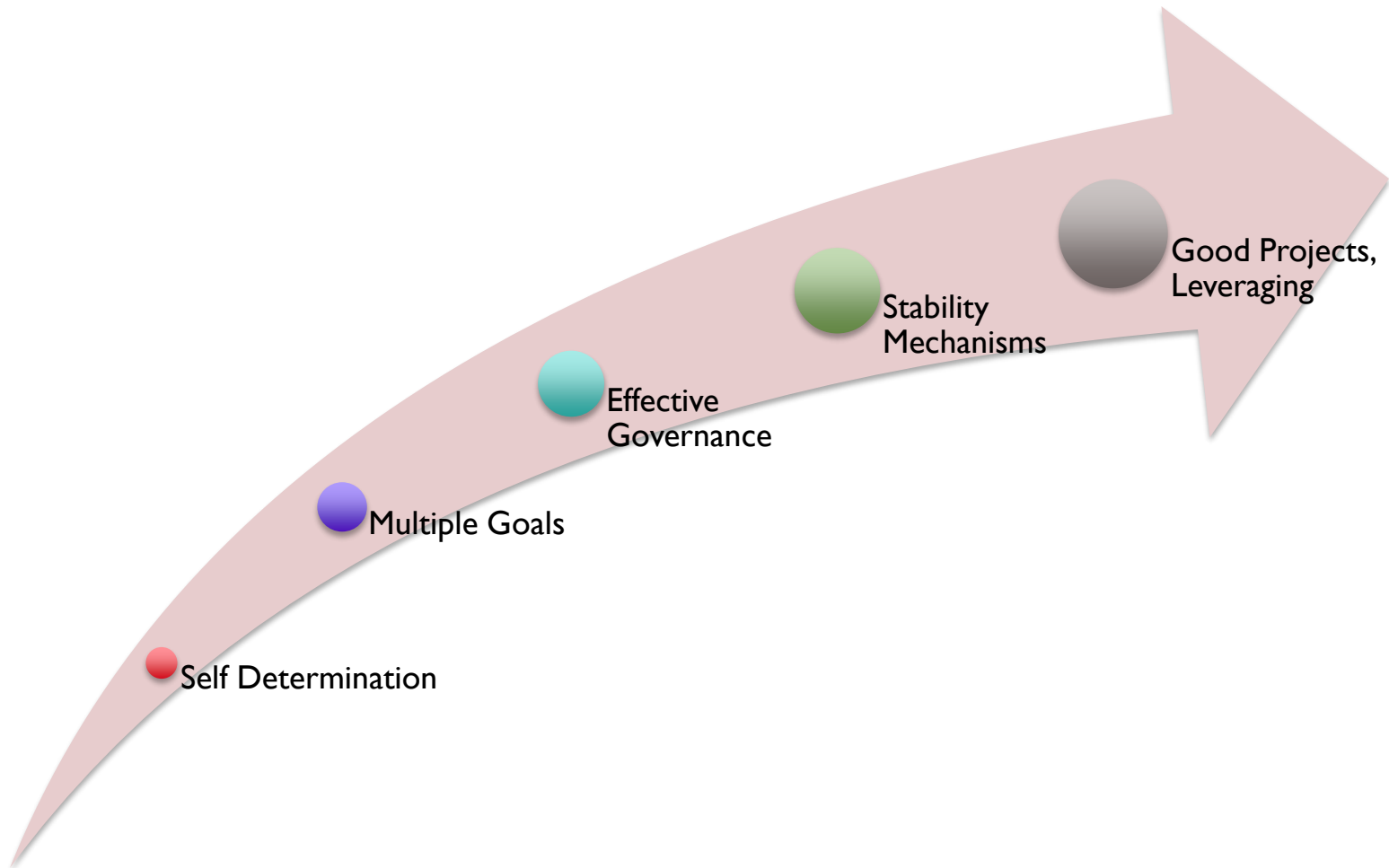
Public sector
important but
inadequate

Improve
access

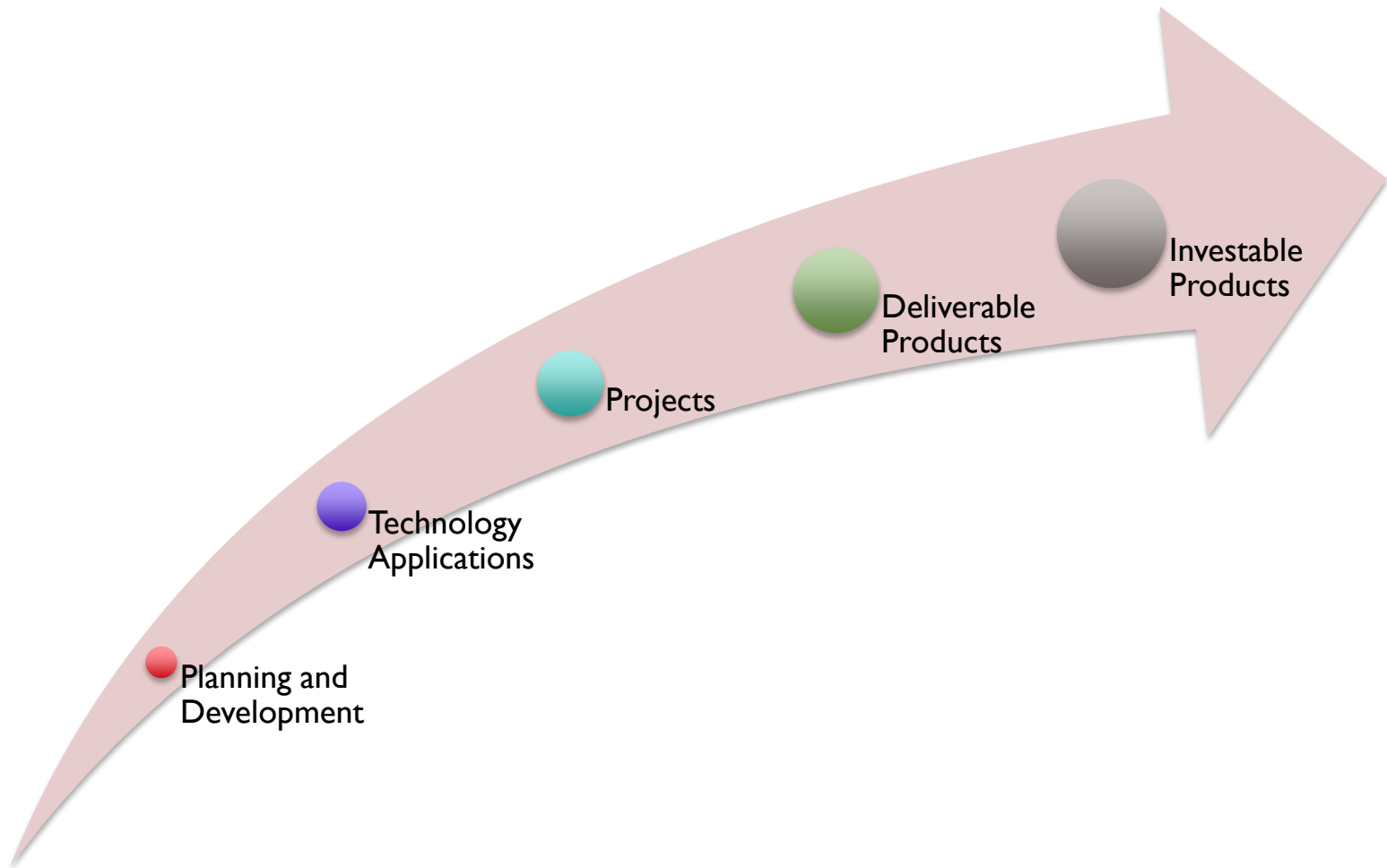
Private sector
large but
undeveloped

Move to
markets

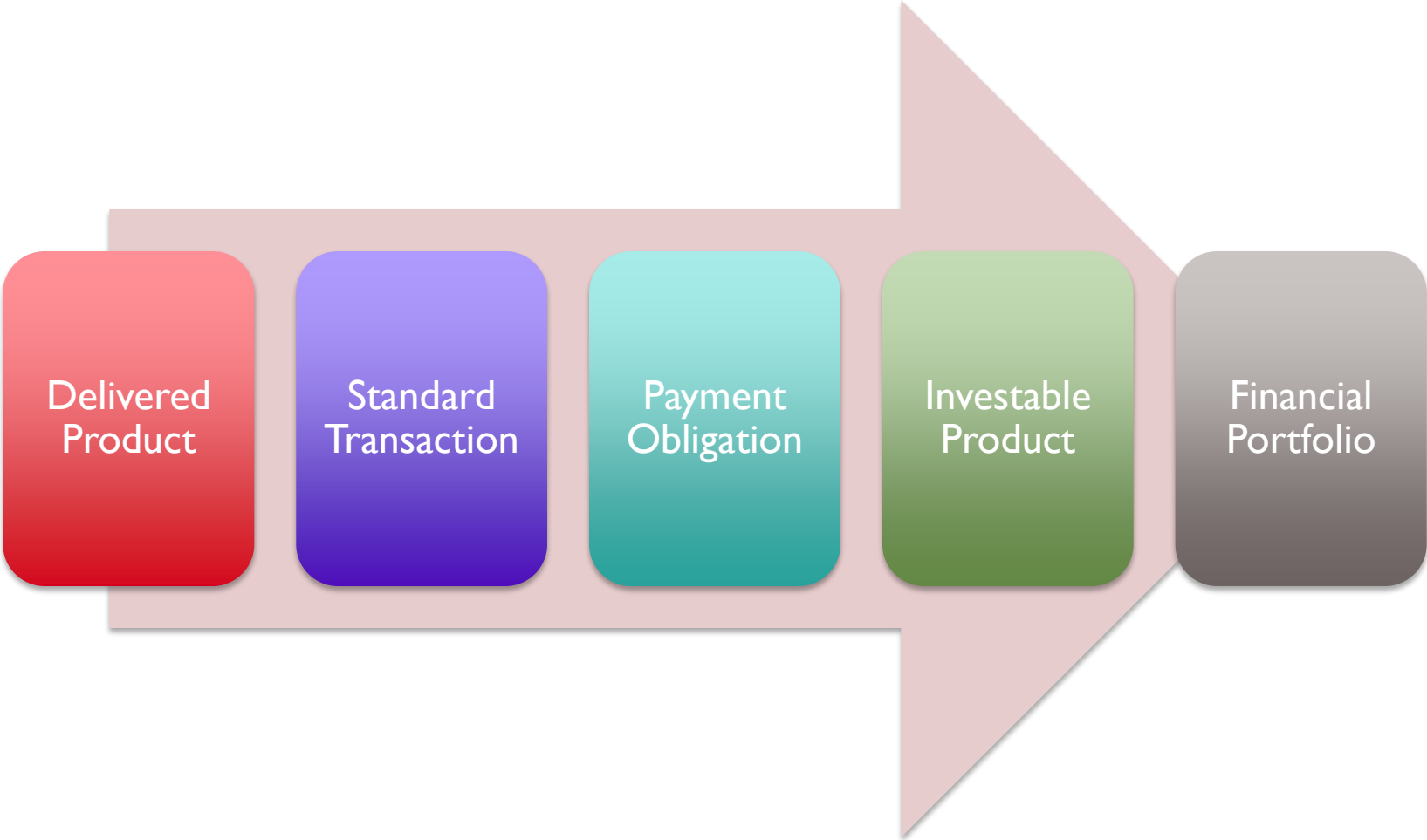
Multi Lateral and Bilateral Donor Evolution



Clean Energy Product Evolution



Project » Product » Portfolio



Technology Applications

Central Installations

- Utility-scale solar PV facilities (>50 kW)
- Utility-scale onshore wind turbine facilities
- Utility-scale offshore wind turbine facilities
- Concentrated solar power (CSP) plants
- Geothermal plants
- Hydroelectric plants (>10 MW)

Mini Grid Components

- Solar PV
- Mini hydro (<10 MW)
- Electricity storage technologies (batteries, fuel cells, etc.)
- Small distributed wind turbines
- Small biomass combustors (with sustainability sourced biomass)
- Biodiesel generators (<100 kW)

Micro Grid Components

- Solar PV (< 1 kW)
- Micro hydro (0.1-1 MW)
- Small distributed wind turbines (1-250 kW)
- Deferrable thermal loads
- Small biomass combustors (with sustainability sourced biomass)
- Biodiesel generators
- Deferrable thermal loads (electricity water heaters)

Off Grid Installations

- Solar PV (< 1 kW)
- Micro hydro (0.1-1 MW)
- Small distributed wind turbines (1-250 kW)
- Electricity storage technologies (batteries, fuel cells, etc.)

Delivered Products

Revenue Streams

- Subscription fee + brokerage fee
- Asset sales + asset lending, leasing, renting
- Commodity sales (electricity)
- Asset sale + commodity sale
- Asset sale + asset lease + brokerage fees

Customer Segments Targeted

- Commercial, Industrial, Residential customers
- Regulated utilities
- Regional transmission organizations
- Load serving entities
- Regional transmission organizations + regulated utilities
- Independent system operators
- Commercial + Industrial customers
- Other combinations of above listed customers segments

Electricity Services

- Firm capacity
- Spinning and non-spinning operating reserves
- Voltage support
- Frequency regulation
- Frequency inertia
- Load following
- Mitigation of electricity network constraints and congestions
- Electricity (energy commodity)

Distributed Energy Resource Leveraged

- Solar PV
- Electricity storage
- Thermal storage
- Distributed micro wind turbines
- Demand response
- Energy management systems (virtual power plant, etc.)

Investable Products

Debt

- Consumer loans
- Commercial loans
- Leases
- Government bonds
- Municipal bonds
- Senior Debt
- Subordinate Debt
- Credit Enhancement
- Etc.

Equity

- Stocks
- Full project ownership
- Full RE equipment ownership
- Blended Debt/Equity
- Etc.

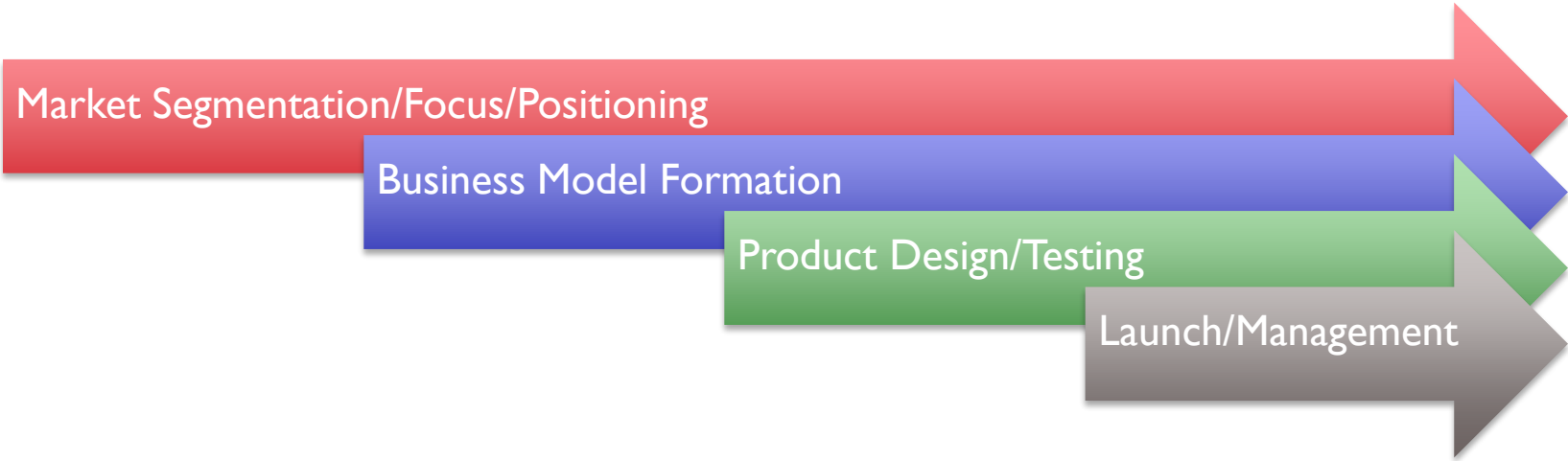
Securitized Structures

- Asset Based Securities (ABSs)
- Collateralized Debt Obligations (CDOs)
- Public Capital Take Out (PCTOs)
- Etc.

Special Purpose Instruments

- Municipal/Community Ownership of Clean Energy Assets
- Lease to Own Structure
- Partnership Flip Structure
- Virtual Power Plants (U.S. Model)
- Etc.

Product Management



Financing



Policy and Finance

Sources of Funds	Intermediary Functions	Uses of Funds
<ul style="list-style-type: none">✓ Debt✓ Equity✓ Gifts✓ Grants✓ Hybrids	<ul style="list-style-type: none">✓ Set public policy goals✓ Create policies and measures✓ Map public and private funds✓ Enable upstream funding✓ Create intermediary bodies to structure, receive, and disburse funds✓ Create end product delivery mechanisms and markets✓ Create necessary instruments✓ Structure investable products✓ Enable secondary investments	<ul style="list-style-type: none">✓ Planning and development✓ Technology acquisition✓ Deliverable products✓ Investable products

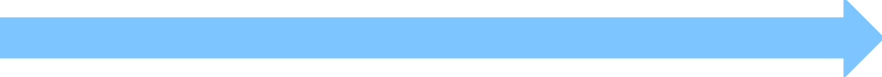
Renewable Energy Needs

Central → Mini Grid → Micro Grid → Off Grid

BAU Gap 

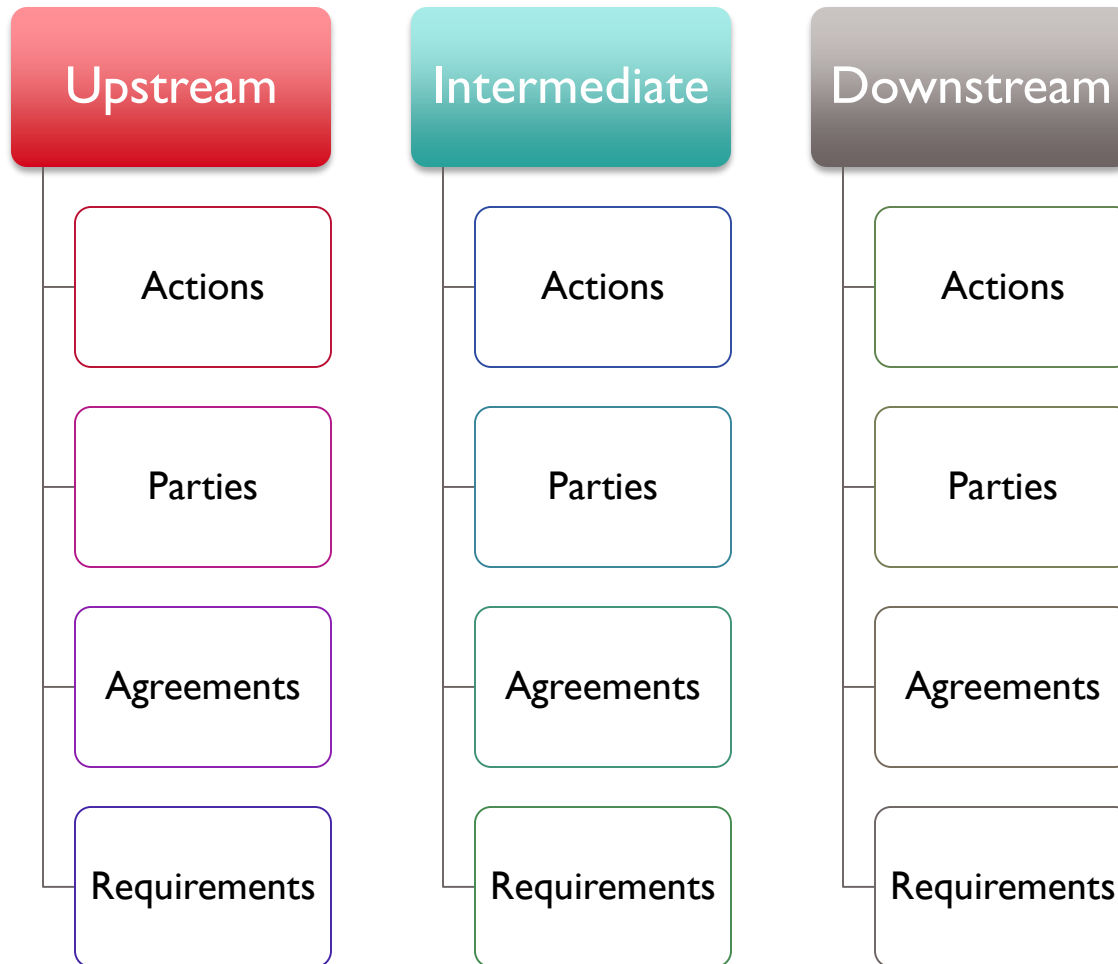
Aggregation 

Standardization 

Better Use of Tools 

New Business Models 

Business Model



Business Model

Phase/Activity	Upstream	Intermediary	Downstream
Action	<ul style="list-style-type: none"> Set policy and market goals Create policies and measures Map public, private finance Create business model Mobilize initial funds 	<ul style="list-style-type: none"> Receive funds Structure markets, products, instruments and tools, delivery programs, administration Build and install program capacity Coordinate full business model Set technical specs and standards 	<ul style="list-style-type: none"> Customer acquisition Product sales Acquire and install technology Manage products and services, including updating and enhancing Manage energy systems Sell secondary products
Parties	<ul style="list-style-type: none"> Funders (e.g. social impact, commercial investors) Government agencies (national, local, regional) Stakeholders (business and citizen) Intermediaries Multilateral institutions 	<ul style="list-style-type: none"> Central bank sustainable finance units Development corporations Development banks Commercial banks Investment banks Green banks NGOs 	<ul style="list-style-type: none"> Technology providers Installers Residential RE buyers Commercial RE buyers Industrial RE buyers Institutional RE buyers Secondary investors
Agreements	<ul style="list-style-type: none"> Goals Funding Actors Outcomes Instruments Business model 	<ul style="list-style-type: none"> Regulatory actions Financial bodies Financial aggregation Financial instruments Financial products Target return, risk, and impact 	<ul style="list-style-type: none"> Price of product (e.g. asset or service) Terms and conditions (e.g. payback period, performance guarantees) Ownership of RE assets Price, terms of secondary financial product
Requirements	<ul style="list-style-type: none"> Policy and Governance Risk, Return, Impact Business model 	<ul style="list-style-type: none"> Regulatory authority Financial solvency Management capacity 	<ul style="list-style-type: none"> RE product performance Financial product pricing Acquisition and use procedures

Market Segments

Government, Private Developers	Upstream Funders	Intermediaries	End-Product Buyers	Secondary Investors
<u>Government Agencies</u> (national, state/provincial/local) Energy <ul style="list-style-type: none"> Environment Economic Interior Finance Industry 	<u>Commercial Investors</u> <ul style="list-style-type: none"> Commercial Banks Individuals National Corporations Transnational Corporations Pension Funds Mutual Funds 	<u>Banks</u> <ul style="list-style-type: none"> Central banks Development banks Green banks Commercial banks Investment banks 	<u>Retail</u> <ul style="list-style-type: none"> Residential households Commercial sector/business Large industrial consumers Military bases Hospitals Large government facilities others 	<ul style="list-style-type: none"> Pension funds Investment funds Corporate investors Individual investors
<ul style="list-style-type: none"> <u>Private Entities</u> Technology providers Service organizations Public interest groups Philanthropies Foreign Governments Multi-Lateral Institutions 	<u>Social Impact Investors</u> <ul style="list-style-type: none"> Mutual Fund Managers Development finance institutions Diversified financial institutions/banks Private foundations Pension funds and insurance companies Family Offices Individual investors NGOs Religious institutions Development Banks Foreign Governments Philanthropies 	<u>Others</u> <ul style="list-style-type: none"> Public-private partnership entities Special purpose institutions Development corporations Consulting firms NGOs 	<u>Wholesale</u> <ul style="list-style-type: none"> Investor owned electricity utilities Government owned utilities Municipal power companies Cooperative electric utilities 	

Examples of upstream investors

- European Bank for Reconstruction and Development (EBRD)
- European Investment Bank (EIB)
- Nordic Environment Finance Corporation (NEFCO)
- Nordic Investment Bank (NIB)
- World Bank
- Eastern Europe Energy Efficiency and Environmental Partnership Program (E5P)
- Green Climate Fund (GCF)
- Global Climate Partnership Fund
- Global Environment Facility (GEF)
- The Swedish International Development Cooperation Agency (Sida)
- U.S. Agency for International Development (USAID)

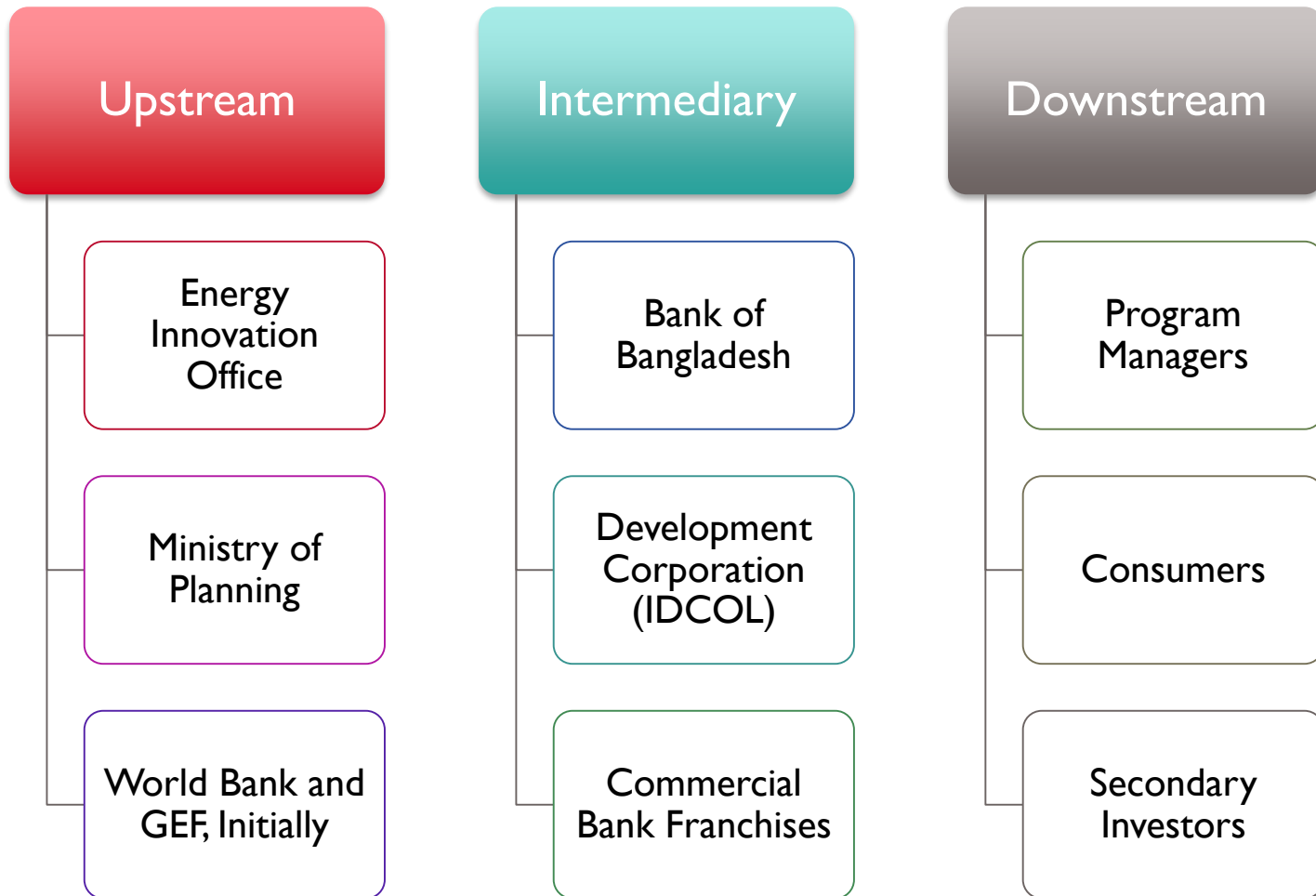
Examples of intermediaries

- KfW (Germany's leading development bank) -- projects in energy and finance sectors, as well as social and public infrastructure
- ProCredit Bank (PCB) Ukraine
- Nordic Environment Finance Corporation (NEFCO)
- Bank "Lviv"
- Ukreximbank (State Export-Import Bank of Ukraine)
- Ukgazbank
- Demo UkrainaDH
- GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit)
- Swiss Cooperation Office (implements in Ukraine Swiss funding channeled through Swiss Agency for Development and Cooperation (SDC) and the State Secretariat for Economic Affairs (SECO))
- Municipal Project Support Facility (MPSF) – Technical assistance and facilitating access to finance for investments in energy efficiency and renewable energy provided by the European Investment Bank

Bangladesh SHS

- Bank of Bangladesh (BB) Sustainable Finance Unit necessary technical assistance to the Pos
- BB created IDCOL, started SHS program in 2003 to ensure universal electricity access by 2021
- IDCOL goal to finance 6 million SHS by 2021, generation capacity of 220 MW of electricity
- 4.12 million SHSs installed in remote areas where grid electrification is challenging, costly
- Solar electricity to 18 million people, 12% total population, previously using kerosene for lighting
- IDCOL initially received credit and grant support from World Bank and GEF to start the program
- GIZ, KfW, ADB, IDB, GPOBA, JICA, USAID and DFID brought expansion support later
- Implemented by 56 Partner Organizations (POs)
- IDCOL provides grant and soft loans as well as
- IDCOL created franchises to place consumer loans to households under standard terms
- POs select customers, extend loan, install the systems, and provide after sale service
- IDCOL total SHS investment is USD 696 million; loan USD 600 million, and grant USD 96 million
- SHS program saved consumption of 1.14 million tons of kerosene worth USD 411 million
- In the next 15 years, 4.1 million SHS will save 3.6 million more tons of kerosene at USD 1.3 billion
- 75,000 people directly or indirectly involved
- Program acclaimed as the largest off-grid renewable energy program in the world.

Bangladesh Solar Home System (SHS)



Bangladesh SHS – Business Model

Steps	1	2	3	4	5
Phase	Develop and implement supporting mechanisms and gather information for program planning and evaluation	Multilateral agencies and other entities provide source funding for the program (grants and soft loans)	Government of Bangladesh (GOB) receives the source funds and sets up a special purpose entity (IDCOL) to administer and implement the program	IDCOL and partners perform detailed program design and development, including putting in place administrative systems	IDCOL Identifies Partner Organizations (POs) to administer financing mechanisms, marketing, customer acquisition, identify equipment suppliers, and provide management. IDCOL provides training and support, monitors program implementation
Parties	<ul style="list-style-type: none"> ▪ Technical, program experts from multilateral agencies, Government of Bangladesh, NGOs, consultants ▪ Market survey contractors ▪ RE assessment contractors 	<ul style="list-style-type: none"> ▪ World Bank ▪ European Bank for Reconstruction and Development ▪ US Agency for International Development (USAID) 	<ul style="list-style-type: none"> ▪ Government of Bangladesh ▪ Special Purpose Entity (IDCOL) ▪ Credit Rating Agency of Bangladesh (CRAB) 	<ul style="list-style-type: none"> ▪ Government of Bangladesh (including ministries and agencies involved) ▪ IDCOL ▪ Technical, program, and financing experts, and other planners 	<ul style="list-style-type: none"> ▪ IDCOL ▪ Partner Organizations (POs) ▪ Qualified Equipment Suppliers/Vendors ▪ Phone marketing organizations

Bangladesh SHS – Business Model

Steps	1	2	3	4	5
Legal, Policy, Administrative, Financial Mechanisms	<ul style="list-style-type: none"> ▪ Multilateral agencies or others provide funding for initial design and assessment work. ▪ Government and funding agencies work together with experts to develop program concept, prepare estimates of costs for the program and plans for implementation, secure funds from donors 	<ul style="list-style-type: none"> ▪ Government and funding agencies work together to further revise program concept, prepare estimates of costs for the program and plans for implementation, secure funds from donors ▪ Government signs contracts with funding agencies ▪ Funding agencies provide technical assistance needed 	<ul style="list-style-type: none"> ▪ Design and prepare legal documentation for special purpose entity (IDCOL) ▪ Transfer funds to IDCOL, hire employees, and further develop implementation plans ▪ Perform credit rating on IDCOL by the state rating agency (CRAB) ▪ Develop procedures for operating national loan revolving fund ▪ Set procedures for quality control. ▪ Establish technical training requirements and programs for PO managers and employees ▪ Provide soft loans and buy-down grants to POs (amounts fall over time) ▪ Create bundles of loans for reinvestment by private and public institutions 	<ul style="list-style-type: none"> ▪ Government and/or multilateral agencies or others provide financing and/or technical support for detailed program design ▪ Set up overall administrative procedures, including communications protocols ▪ Identify other national or jurisdiction-level programs with which the SHS program might interact 	<ul style="list-style-type: none"> ▪ Technical Specification and Certification Requirements for SHS systems, installers ▪ Solicit applications for POs by jurisdiction ▪ Assess readiness and Effectiveness of POs, and select/certify operators for specific areas ▪ SHS Systems Selected by POs Quality Check ▪ Environment Conservation Act 1995 ▪ Environment Risk Management (ERM) Guideline of Bangladesh ▪ Evaluate the level of interference of local political officials into the program implementation. ▪ Create bundles of loans for reinvestment by private and public institutions ▪ Evaluate induced competition between POs

Bangladesh SHS – Business Model

Steps	1	2	3	4	5
Analytical Requirements	<ul style="list-style-type: none"> Review of fraction of homes lacking electricity nationally Review baseline expectations for need for energy services, including growth in electricity demand and in electrical grid interconnections Identify availability of solar technology and suitability for application for SHS 	<ul style="list-style-type: none"> Revise estimate of overall markets for program Estimate capital requirements for program based on scale desired and technologies to be included Estimate market response to program Assess funding available, and adjust scale as needed 	<ul style="list-style-type: none"> Capital on hand vs amount of loans outstanding in revolving fund Fraction of loan defaults Number of households in each area that are candidates for program based on lack of access to grid electricity, both current and future Types of consumers, households and shifts over time (household size, dwelling type, household versus village scale) Typical power and electrical energy requirements by household and by end-use—current and future (including trends) Trends in technology, including PV and battery technologies, costs, performance, availability 	<ul style="list-style-type: none"> Identify administrative costs for program Identify initial system cost and related parameters of program, including costs of alternative fuels, so as to be able to design size and interest rates of loans offered under program 	<ul style="list-style-type: none"> Vulnerability of selected systems as installed to windstorm, flood Failure rates of installed systems, repair requirements Number of employees, years of education, experience and expertise Debt/equity ratio of POs Number of systems placed per employee, per application Fraction of performing, non-performing loans # installation complaints Rate of repayment during the extended grace period and during program Rate of product voluntary return by customers due to the perception that cost does not justify the benefit

**Next
Steps**

**Policies &
Technologies**

**Additional
Work**

Ukraine EC LEDS/MERP – Renewable Energy

- Creating incentives for production and consumption of energy from renewable sources
- Development of international sectoral integration of Ukraine in the renewable energy sector
- Ecologically sustainable production and expansion of biomass (biofuel) use
- Biogas production and expansion of its use for heat energy and electricity production
- Production of liquid/gaseous biofuel for stationary and mobile use

Ukraine EC LEDS/MERP – Energy Efficiency

- Improvement of building energy efficiency
- Promotion of private and public financing for the energy efficiency measures
- Energy efficiency measures specific for use of electricity and heat power and/or types of fuel for all sectors of economy
- Creating incentives for introduction of energy efficient technologies in the agro industrial complex

Ukraine EC LEDS/MERP -- Transformations

- Introduction of GHG emission trading system
- Improvement of GHG emission taxation system and purpose allocation of those funds
- Support and dissemination of research and development works (R&D) for low emission technologies of next generation and “clean energy” companies
- Activation of community participation in sustainable development policies and measures
- Disclosure of information on environmental aspects/GHG emissions
- Improvement of energy efficient solutions for public procurement
- Training and advanced training for specialists in the sectors of energy efficiency, renewable and alternative energy
- Programs on increasing awareness of the households and introduction of the university and school programs on energy efficiency, renewable and alternative energy
- Improvement of requirements to eco-design and labelling of energy related products
- Improvement of motor fuel standardization system
- Improvement of logistics and transport system management, new approaches to organization of cargo transportation and work of transport
- Improvement of labor relations organization to motivate remote work

Ukraine EC LEDS/MERP – Modernization/Innovation

- Improvement of power stations efficiency in the Bulk Electricity System of Ukraine
- Nuclear energy development
- Reduction of leakages during extraction, processing and transportation of fossil fuel
- Modernization and intellectualization of electric networks
- Development of cogeneration of heat and electricity on the local and regional levels
- Development of energy accumulation technologies
- Development of hydrogen production technologies
- Improvement of methods for regulation of carbon content in soil
- Optimization of fertilization systems for agricultural plants
- Transport infrastructure modernization
- Creating incentives for use of innovative means of transport

Ukraine EC LEDS/MERP – Waste and Resources

- Improvement of waste management, reuse and recycling of solid waste
- Measures to reduce amount of waste formation and to waste formation
- Rational water use
- Wastewater management improvements
- Improvement of components of the process of waste animal products management

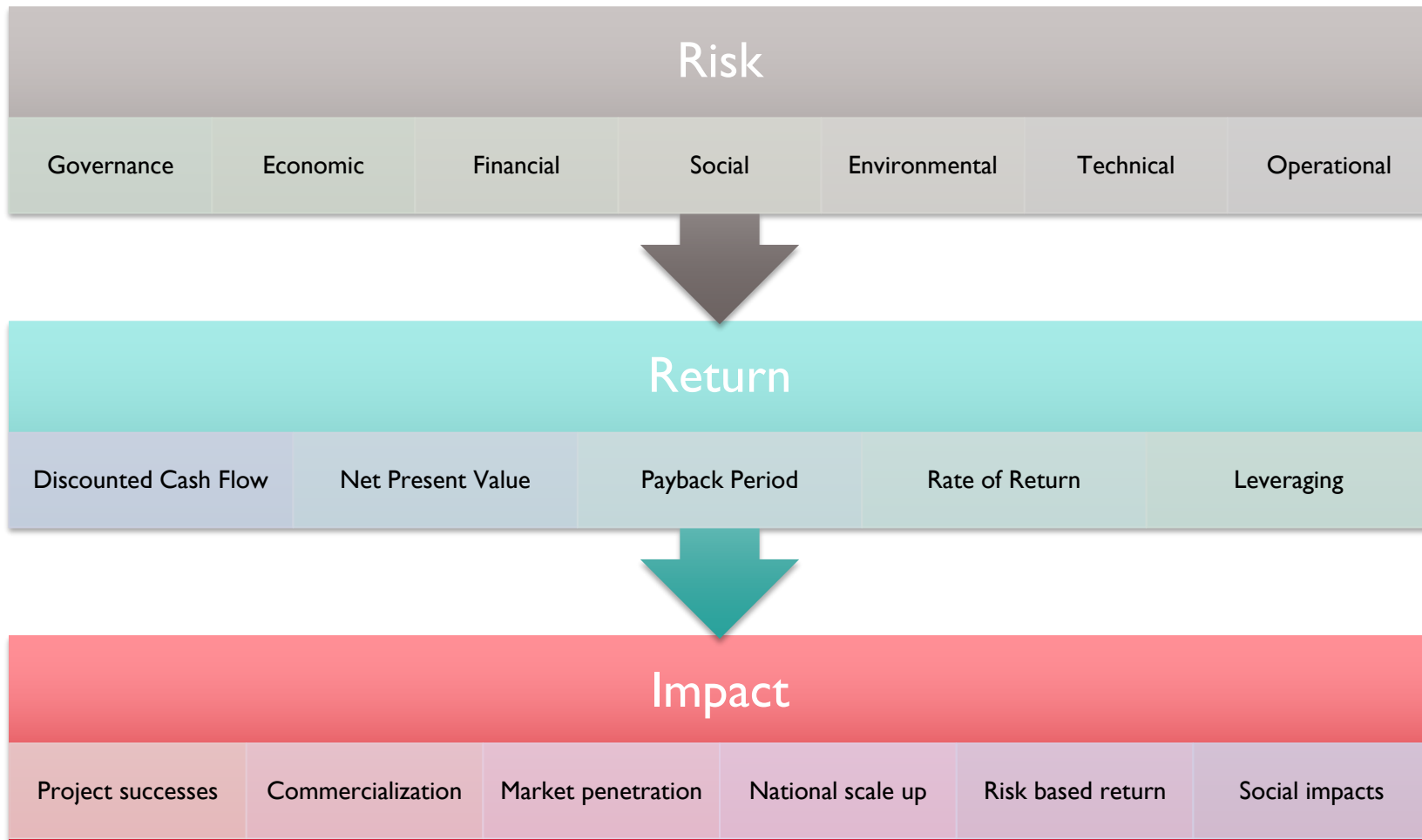
Ukraine EC LEDS/MERP – CO2 Absorption

- Forestation and afforestation, increase of hayfield, orchards and pasture area
- Carbon sequestration in forest biomass and soil
- Forest management for increase of carbon sequestration
- Green planting in inhabited localities, protection and reproduction of vegetation

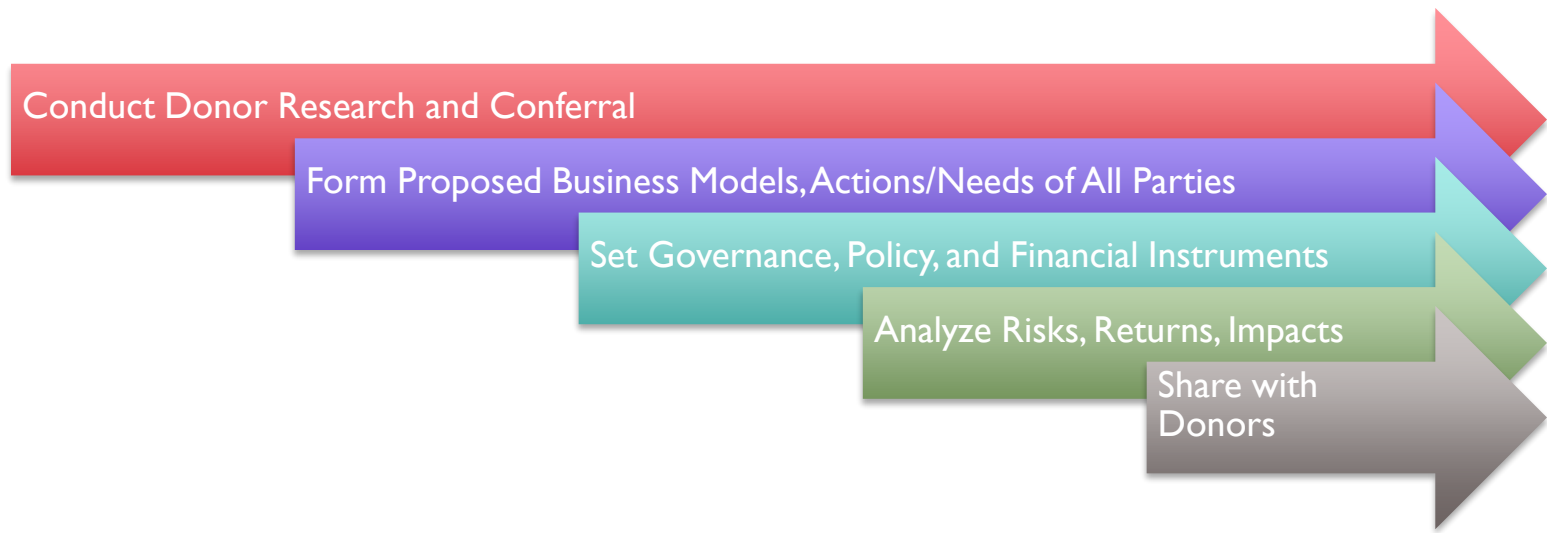
Ukraine EC LEDS/MERP

Practice or Technology	Draft Business Model	Policy Goals, Design	Governance & Stability Mechanisms	Risk Evaluation	Financial Mapping	Financial Return Analysis	Public Impact Analysis
Renewable energy (5)							
Energy efficiency (4)							
Market and institutions transformation (12)							
Modernization and innovations (11)							
Waste management and economical use of natural resources (5)							
CO ₂ absorption (4)							

Design and Analysis



Next Steps





USAID
FROM THE AMERICAN PEOPLE

Thank You!

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