



МИНИСТЕРСТВО ЭНЕРГЕТИКИ  
РОССИЙСКОЙ ФЕДЕРАЦИИ

# **RUSSIAN STATE POLICY ON ENERGY EFFICIENCY: PRIORITIES, GOALS, RESULTS**

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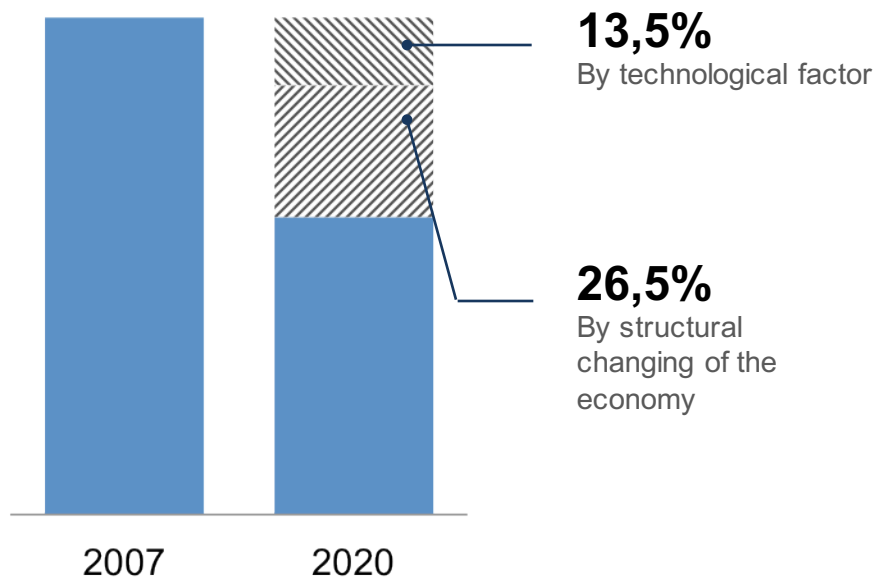
**APEC EGEE&C MEETING**

29 March 2017  
Jeju, Korea

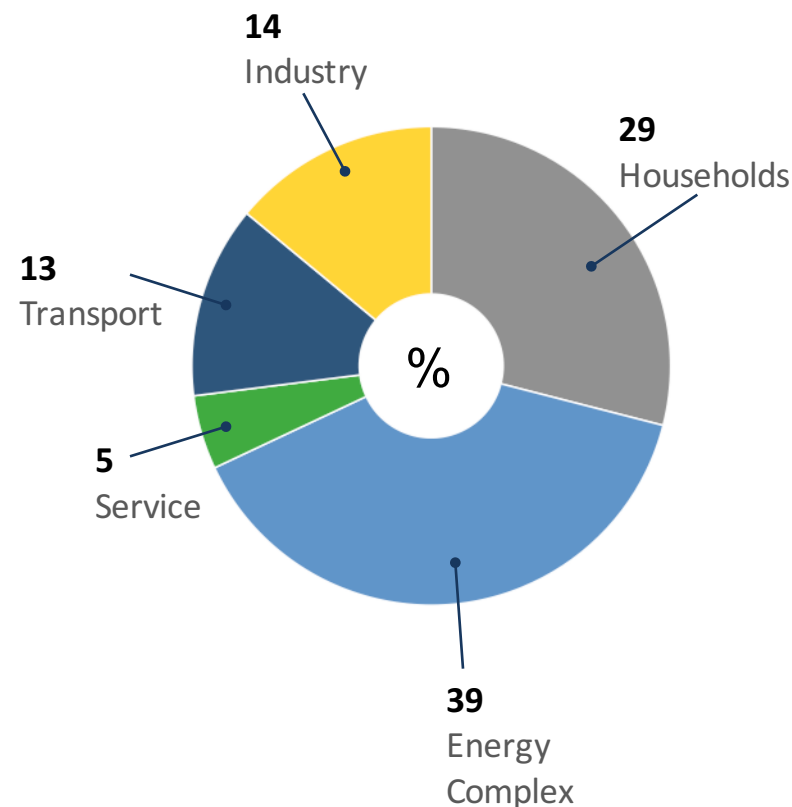
# KEY AIM OF RUSSIAN STATE POLICY ON ENERGY EFFICIENCY

## Reduction of Energy Intensity of GDP by 40 % by 2020 compare to 2007

(President decree № 889, 4 June 2008)



## Potential of Energy Intensity Reduction of GDP by Economic Sectors

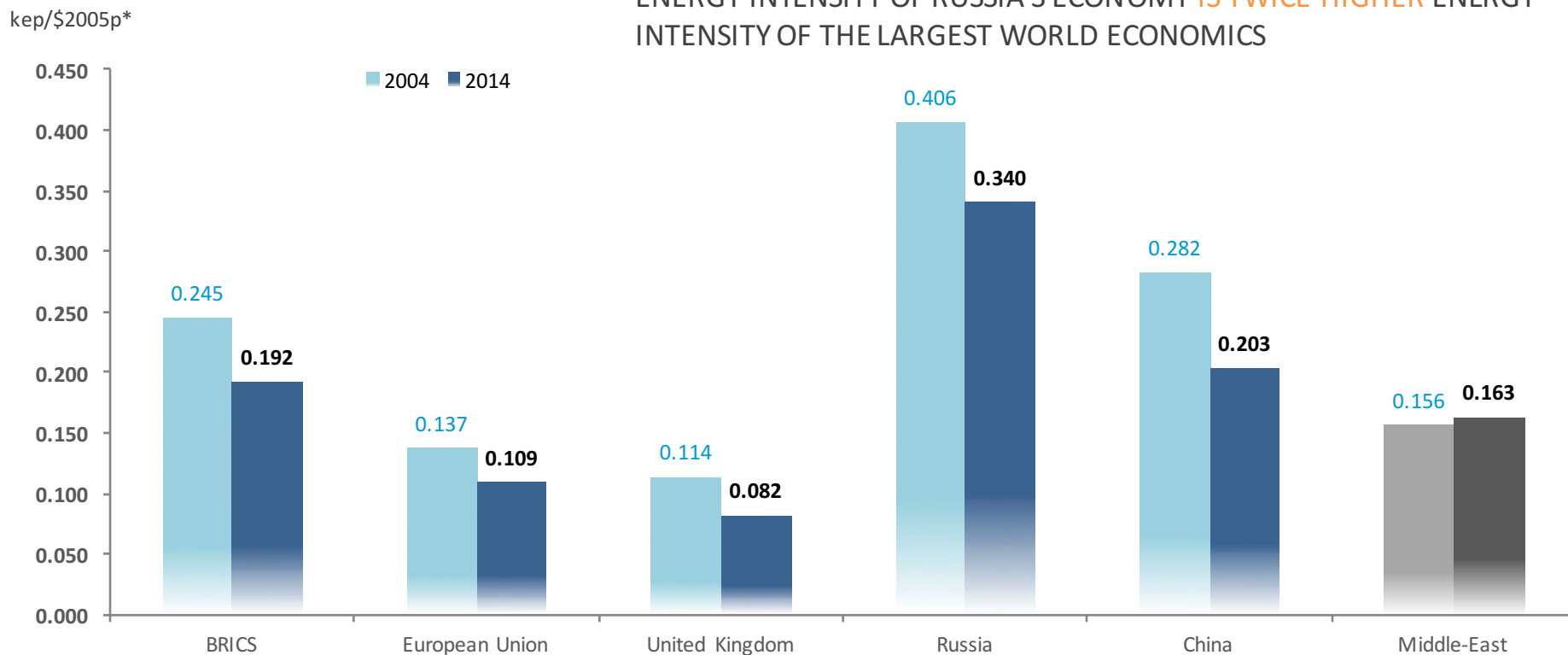


Russian State Program on Energy Efficiency and Development of Energy Sector  
Subprogram on Energy Efficiency and Energy Saving

# INTERNATIONAL EXPERIENCE. TARGETS REMAINS AMBITIOUS



## ENERGY INTENSITY OF RUSSIA'S ECONOMY IS TWICE HIGHER ENERGY INTENSITY OF THE LARGEST WORLD ECONOMICS



\* - kep/dollars at constant exchange rate, price and purchasing power parities of the year 2005

<https://yearbook.enerdata.ru>

## EXAMPLES OF CURRENT TAGRETS BY COUNTRIES

Reduction of energy consumption  
In the European Union



Reduction of energy intensity  
of GDP in the USA



Reduction of Energy intensity  
Of increment of the share of the USA economy



Reduction of energy intensity  
of GDP in China



# KEY DIRECTIONS OF RUSSIAN STATE POLICY ON ENERGY EFFICIENCY

## INTERNATIONAL CASE STUDY



### MANAGEMENT SYSTEM

Key indicators on energy efficiency in the economic sectors

*European Union. National Plan on energy efficiency (under the directive 2012/27/EU), United Kingdom*



### TECHNOLOGICAL REGULATION

Building Codes and equipment requirements

*European Union, Directive on Energy performance of buildings (2002/91/EC, 2010/31/EU), France, UK, Japan*

Promoting implementation of Best Available Technologies through ecological regulation

*European Union 7 Directive on Industrial Emission (2010/75/EU)*



### FINANCIAL INCENTIVES

Implementing incentive pricing and energy taxes

*European Union 7 Directive on energy taxes (2003/96/EC), Germany*

Promoting of energy service contract mechanisms and subsidies program

*USA (Super-ESPC)  
UK Green Deal)*



### SUPPORTING MECHANISMS

Implementation of statistical system for monitoring energy efficiency

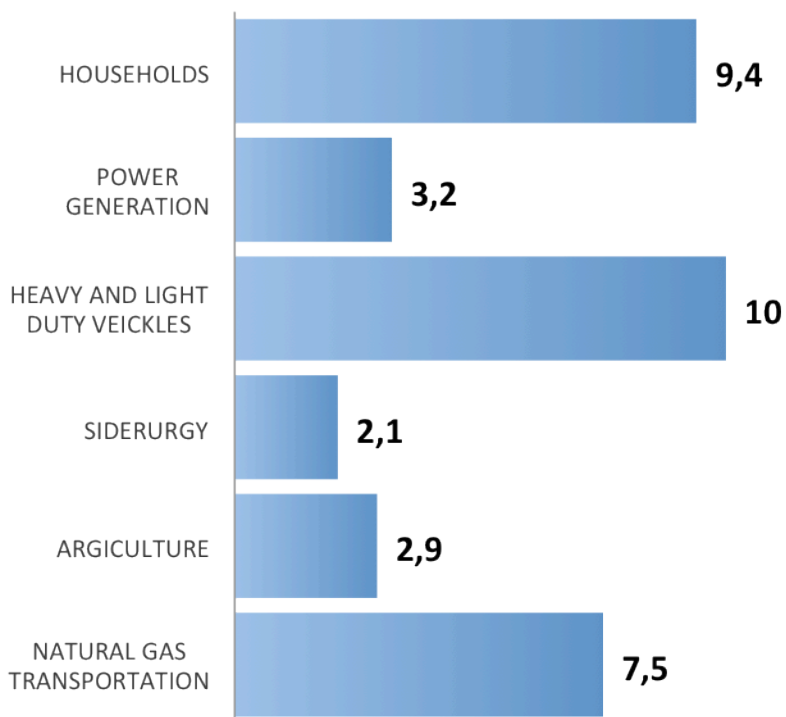
*European Union, project ODYSSEE-MURE*

Public awareness on energy efficiency and energy savings

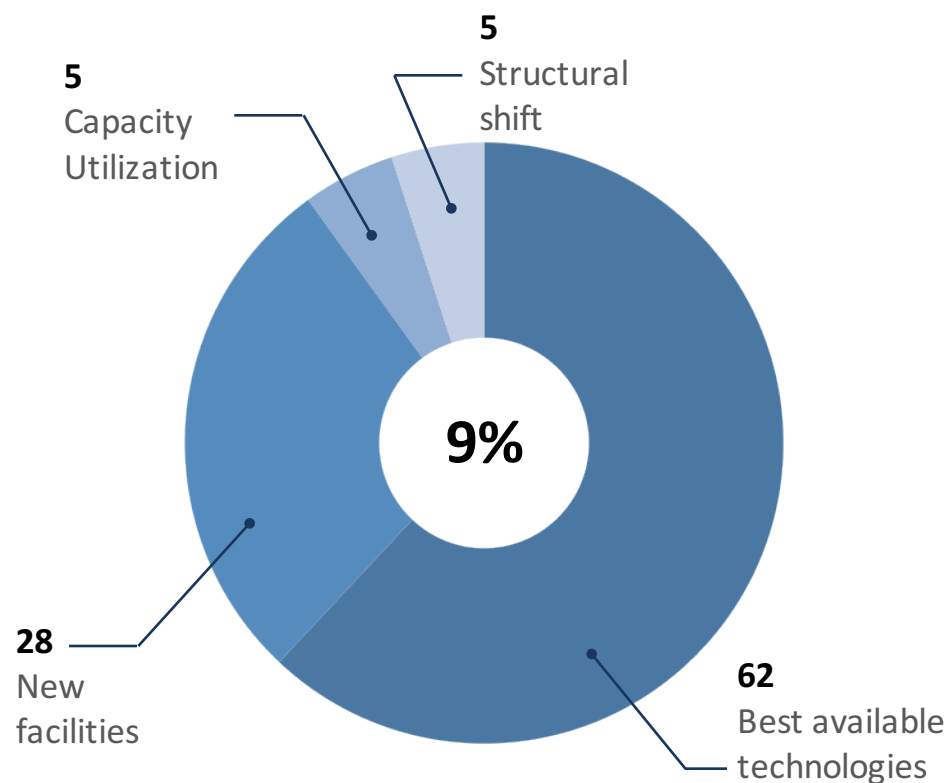
*Finland, France*

# MAIN RESULTS OF RUSSIAN STATE POLICY ON ENERGY EFFICIENCY

DEGREE OF REDUCTION OF ENERGY INTENSITY IN KEY INDUSTRIES COMPARE TO 2010 (%)



REDUCTION OF ENERGY INTENSITY OF GDP COMPARE TO 2007





# POTENTIAL OF SECTORAL INITIATIVES WITH HIGH ENERGY EFFICIENCY EFFECTS WHICH MIGHT BE REALISE IN NEAR FUTURE



PROGRAM OF  
IMPLEMENTING ENERGY  
EFFICIENCY STREET  
LIGHTNING



USE OF HYBRID POWER SYSTEMS FOR  
REMOTE LOCATION



IMPLEMENTING OF FEDERAL STANDARTS  
OF ENERGY EFFICIENT CONSTRUCTION



MODERNISATION OF CENTRAL  
HEATING AND COOLING SYSTEMS  
IN THE CITIES



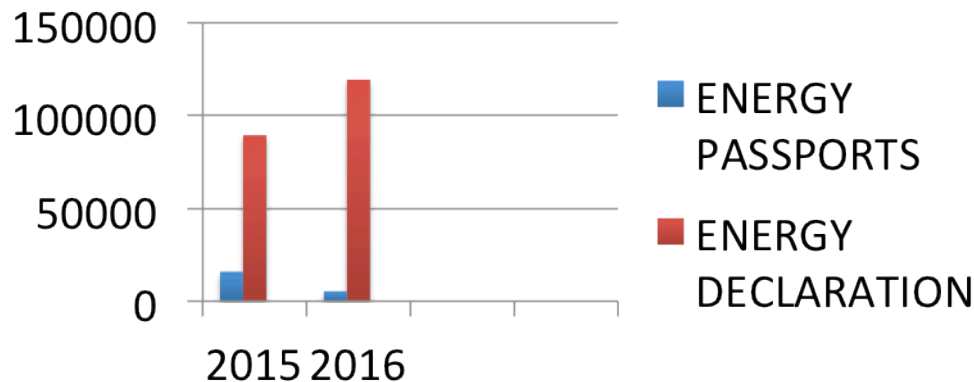
PUBLIC AWARENESS ON ENERGY  
EFFICIENCY



IMPLEMENTATION OF LABELING OF  
HOUSEHOLD APPLIANCES

# MAIN RESULTS IN 2016

- FINISHING THE FIRST STAGE OF ENERGY AUDIT REFORM
- CONTINUING THE REFORM OF ENERGY MANAGEMENT SYSTEM AT ALL LEVEL



## SOME MAIN FIGURES

**61%** RUSSIAN BIGGEST COMPANY IMPLEMENTED ISO 50001

**39%** RUSSIAN REGIONS IMPLEMENTED STANDARDS OF ENERGY EFFICIENCY POPULARISATION

**48%** RUSSIAN REGIONS IMPLEMENTED ENERGY EFFICIENCY STANDARDS IN BUILDING RENOVATION

**75 % ENERGY  
CONSUMED IN CITIES**

**75 % CO2 EMISSION  
IN CITIES**



## VI INTERNATIONAL FORUM “RUSSIAN ENERGY WEEK” 4-7 OCTOBER 2017, Moscow

### INTERNATIONAL MEETING OF MAYORS

- MAIN TOPICS FOR DISCUSSION  
Energy, buildings, sustainable development, transport
- MAIN RESULT OF THE MEETING  
Starting of benchmarking among cities



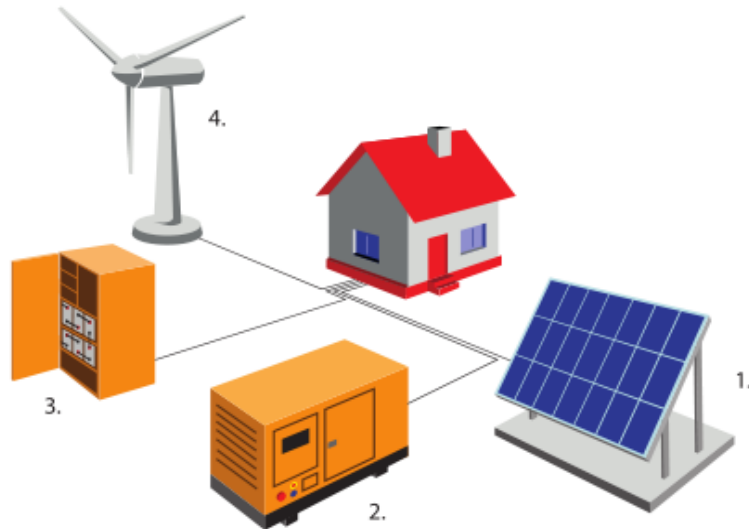
# RENEWABLES FOR UNDERPOPULATED PLACE

2/3 COUNTRY'S TERRITORY

20 MLN OF PEOPLE

0,7% TOTAL ENERGY USE

NO CENTRALIZED POWER SUPPLY SYSTEM



## HYBRID POWER SUPPLY SYSTEM

Universal autonomous power station:

- 1 Photovoltaic battery
  - 2 Diesel generator
  - 3 Management module
  - 4 Windpower
- Voltage converter  
-Storage

COMBINATION OF SEVERAL KINDS OF RES  
DEPENDING ON GEOGRAPHICAL FEATURES





# **PRESANTATION**

## **PART II**

# EXAMPLES AND PARAMETERS



- For standard township (100 people) with an installed load of **450 kW**:
- Generation of electricity from wind: at least **500 MW\*h/year** (50% of total requirements);
- The cost of construction of the wind farm: USD **1.3– 1.7** mln;
- Annual maintenance costs: USD **31** thousands.



**Menza project,**  
**Zabaikalskiy district** (pilot project of implementation of solar energy technology, overall capacity – **520 kW**)



- For standard township (100 people), with an installed load of **450 kW**:
- Generation of electro energy: at least **500 MW\*h/year** (50 % of the total need);
- The cost of construction of typical solar plant: USD **1.3– 1.7** mln;
- Annual operating cost: USD **17** thousands.

**Ust-Kamchatsk pilot project**  
(Wind turbine, **275 (kW)**, adjusted to the local climatic conditions)



- For standard settlement (100 people), with an installed load of **450 kW**:
- Electricity generation from Mini-HPP: within **4 000 MW\*h/year** ( up to 100 % of the total need);
- The cost of construction: USD **3.5 – 6.4** million without VAT;
- Annual operating cost: USD **86** thousands.



**Tomskaya Mini-HPP, 1 MW**

# INITIATIVE “Bridging Gap in Economic Development and Integration of Remote Areas for Sustainable Growth in the APEC Region

## BACKGROUND

1. Remote areas are usually located far from political, financial and business centers, in harsh climatic and geographical conditions
2. Remote areas face a number of general “bottlenecks”, including lower level of industrial and social development, weaker development of infrastructure
3. Insufficient development of remote areas hinders economic growth, brings a number of problems, such as social tension, burdening financial aid and its irregular distribution, corruption, criminogenic environment, etc
4. Development of remote areas is essential both for global and regional economies

## KEY OBJECTIVES

- Launch of the APEC dialogue on comprehensive development of remote areas
- Study measures and mechanisms used by the APEC economies to overcome the “bottlenecks” of remote areas
- Sharing experience and best practices with a view to their dissemination in the Asia-Pacific
- Strengthening of cooperation to promote regional economic integration and sustainable, secure and inclusive growth
- Improving the quality of life in the Asia-Pacific

- The initiative was supported by
  - China
  - Indonesia
  - Japan
  - Philippines
  - Thailand



- **Why this issue is also important for APEC economies?**

## LEADERS PRIORITIES

- In 2015's APEC Joint Energy Ministerial Statement identify their priority goal in “providing energy access to APEC people, including remote communities”.
- In 2016 APEC leaders recognized that “energy access and energy security are critical to the shared prosperity and future of the region and reaffirm their readiness to further energy cooperation, including areas such as renewable energy sectors and energy efficiency to create necessary conditions for trade, investment and economic growth”.



- **Why this issue is also important for APEC economies?**
- APEC economies have a diversified geographic structure including **remote areas** and **islands** are those that experience the most acute challenges to reliable and affordable access to energy
- Today, more than **400** million people in Asia-Pacific region do not have access to electricity
- Several important aspects of work which highlighted by **APEC Energy Working Group** are: enhancing the security of energy supply networks; promoting energy efficient and sustainable communities; supporting cleaner energy development etc.
- The widespread use of hybrid power systems and renewables directly corresponds with the main goals of APEC community to **double renewable energy** in the regional energy mix by 2030, conduct **low-carbon** energy policy and **reduce energy intensity**



# SPECIFIC EXAMPLES

- ✓ The improvement of capacity factors of variable renewables in **remote areas** in **China** because of transmission network enhancements. China also has a large technical potential of renewable energy resources, the quality of which is on par with the average level in APEC. Considering the wind speed, for example, average capacity factors of wind power place China in **9th** ranking in the APEC region.
  - ✓ In an effort to move towards low-carbon and sustainable development, China invested nearly USD **90** billion in clean energy in **2014**, exceeding the total amount of all other economies in Asia (Bloomberg, 2015).
  - ✓ High retail- and geography-related delivery costs are motivating a trend in **Australia** toward a less **centralised** and more distributed electricity sector. The high cost of using centralised power in **remote areas** is becoming less favourable than a decentralised model using rooftop solar, local generation etc.
  - ✓ In **New Zealand** there is an aspirational target of **90 %** electricity generation from renewables by **2025**.
  - ✓ One of the main recommendation for the government of **Peru** is facilitation of energy access to geographically **remote** or economically disadvantaged regions, as it is not currently possible for the private sector to supply energy to such areas.
  - ✓ In **Philippines** through the Household Electrification Development Plan (HEDP) and the Sitio Electrification Program (SEP) envisage to cope with household lighting in off-grid areas and *sitios* (clusters of households), using mature renewable energy technologies such as **photovoltaic** solar home systems (PV-SHS), **PV streetlights** and **micro-hydro** systems. It aims to contribute to the government's goal of **90 %** household electrification by **2017**.
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# THE INITIATIVE



- The project proposed is – the creation of **the Atlas** of remote areas of APEC economies with the determining of climatic and techno-economic potential and further classification for implementation of low-carbon energy solutions with the use of hybrid power systems and RES for sustainable energy supply of specified areas
- **The Atlas** could become one of the foremost instruments for designing integrated solutions adjusted to local geographical features for energy supply of remote areas of APEC economies

## Background

1. Project “Piloting smart/micro grid projects for insular and remote localities in APEC economies” (S EWG 15/11 A)
2. Project “Workshop on Improving Energy Resiliency in Off-Grid Areas in APEC Member Economies” (EWG 09 2015A)
3. Current project “Off Grid Electrification Option for Remote Regions in APEC Economies” (EWG 07 2016A ).

***During previous several years EWG indicated sustained interest to developing electricity projects in remote areas and islands. Meanwhile none of the project addresses to the challenges of the remote areas and islands in general to provide with the strong understanding of types and scale of mentioned above territories in APEC.***



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СПАСИБО ЗА ВНИМАНИЕ!