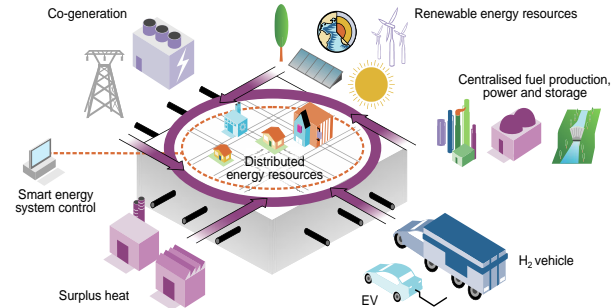
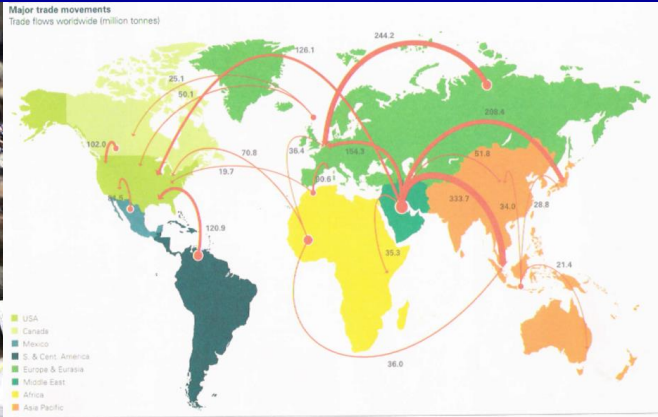


# Energy Index

## 에너지 지수



# 에너지 지수

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## Energy Security (에너지안보)

- 국가별로, 기관별로, 학자별로 다른 definition
- Grubb et al. (2006) : a system's ability to provide a flow of energy to meet demand in an economy in a manner and price that does not disrupt the course of the economy.
- Andrews (2005) : Energy security is to assure adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardize major national values and objectives.
- Creti and Fabra (2007) : In the short-term, supply security requires the readiness of existing capacity to meet the actual load.
- Olz et al. (2007) : Energy security risk is the degree of probability of disruption to energy supply occurring.

# 에너지 지수

## Degree Days (Heating/Cooling)

### 미국 EIA 정의

① **냉방도일 (CDD)** : A measure of how cold a location is over a period of time relative to a base temperature, most commonly specified as 65 degrees Fahrenheit.

The measure is computed for each day by subtracting the average of the day's high and low temperatures from the base temperature (65 degrees), with negative values set equal to zero. Each day's heating degree days are summed to create a heating degree day measure for a specified reference period. Heating degree days are used in energy analysis as an indicator of space heating energy requirements or use.

② **난방도일 (HDD)** : A measure of how warm a location is over a period of time relative to a base temperature, most commonly specified as 65 degrees Fahrenheit.

The measure is computed for each day by subtracting the base temperature (65 degrees) from the average of the day's high and low temperatures, with negative values set equal to zero. Each day's cooling degree days are summed to create a cooling degree day measure for a specified reference period. Cooling degree days are used in energy analysis as an indicator of air conditioning energy requirements or use.

# 에너지 지수

## Energy Security (에너지안보)

- 국가별로, 기관별로, 학자별로 다른 definition
- Kruyt et al. (2009) :
  - Availability (or elements relating to geological existence)
  - Accessibility (or geopolitical elements)
  - Affordability (or economical elements)
  - Acceptability (or environmental and societal elements)
- World Energy Council (WEC) : Energy Trilemma
  - 에너지 안보 (Energy Security)
  - 에너지 형평성 (Energy Equity)
  - 환경지속성 (Environmental Sustainability)
- APERC (2007) : Energy security is the ability to guarantee the availability of energy resource supply in a sustainable and timely manner with the energy price being at a level that will not adversely affect the economic performance of the economy

# 에너지 지수

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## Energy Security (에너지안보)

- the 3 As by WEC
  1. 'Accessibility' to modern, affordable energy for all;
  2. 'Availability' in terms of continuity of supply and quality and reliability of service; and
  3. 'Acceptability' in terms of social and environmental goals.
  
- the 4 As by APERC
  1. 'Availability' refers to the availability of oil and other fossil fuels and nuclear energy
  2. 'Accessibility' considers the barriers to accessing energy resources
  3. 'Affordability' of energy (limited to fuel prices, price projections, and infrastructure costs)
  4. 'Acceptability' surrounding environmental issues dealing with coal (carbon sequestration), nuclear, and unconventional fuels (biofuel and oil sands).

# 에너지 지수 – WEC Trillema Index



## The World Energy Council (WEC, 세계에너지협의회)

- 1923년 영국 런던에서 설립된 에너지 전문 국제 민간기구
- UN이 공인한 에너지단체이며 특정 이해집단에 편향되지 않은 네트워크
- 100여 개국의 공공분야와 민간분야를 망라한 3000여 개의 조직을 대표함
- 지속 가능한 에너지의 공급과 이용을 통해 모든 사람에게 최대의 혜택을 주는 것을 목표로 함
- 매년 세계 각지의 에너지 매장량, 정책, 이슈 등을 포함한 보고서를 발간
  
- 2011년부터 매년 국가별 Energy Sustainability Index와 순위 제공

# 에너지 지수 – WEC Trillema Index

## ‘에너지 트릴레마의 균형’

### 에너지 안보

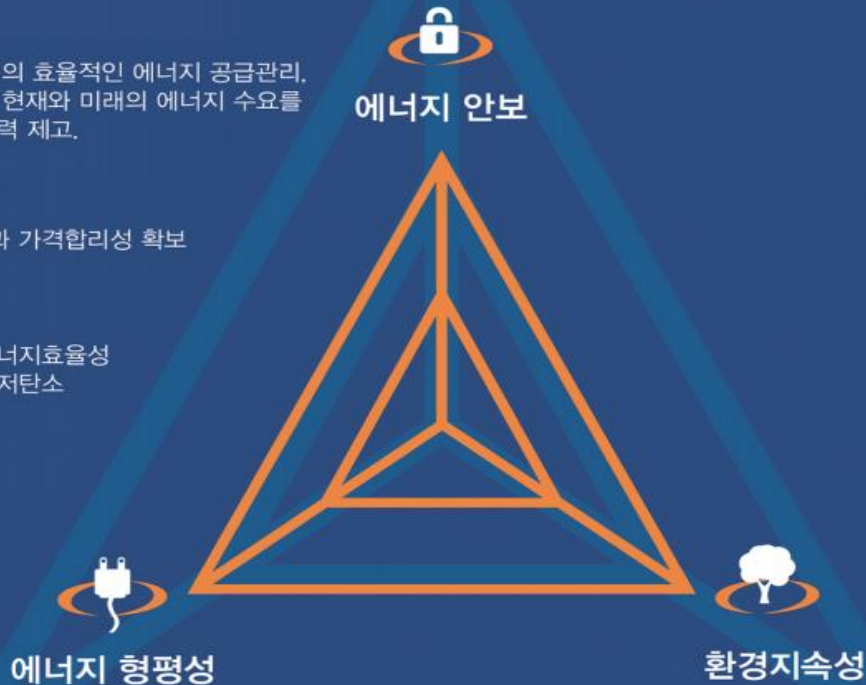
국내외 여러 에너지원으로부터의 효율적인 에너지 공급관리, 안정적인 에너지 인프라 구축, 현재와 미래의 에너지 수요를 충족할 수 있는 에너지 공급능력 제고.

### 에너지 형평성

에너지에 대한 보편적 접근성과 가격합리성 확보

### 환경지속성

공급과 수요 양 측면에서의 에너지효율성 개선 및 신재생에너지와 기타 저탄소 에너지원 개발

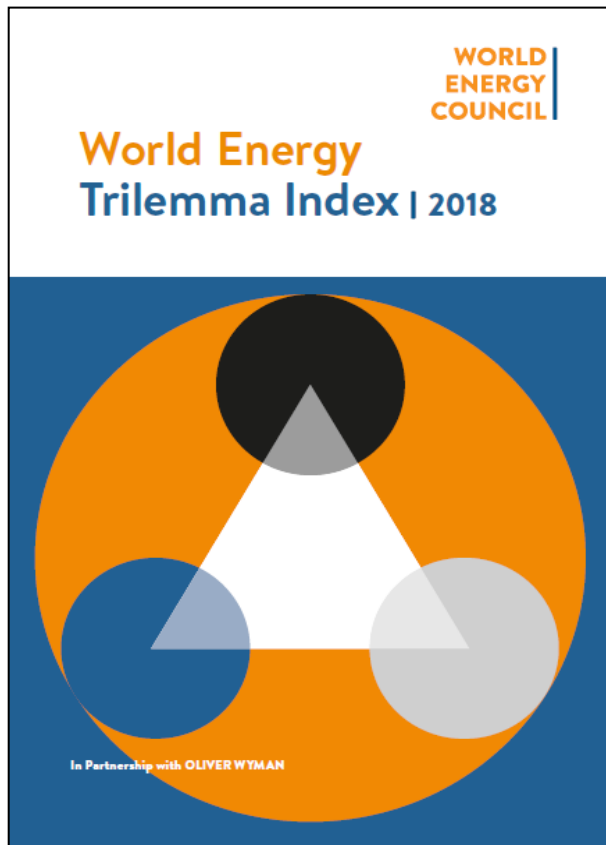


# 에너지 지수 – WEC Trillema Index

Total score	Indicator type	Dimension	Indicators
Country performance <b>100%</b>	1. Energy performance <b>75%</b>	1.1 Energy Security <b>25%</b>	1.1.1 Ratio of total energy production to consumption 1.1.2 Diversity of electricity generation 1.1.3 Distribution losses as a percentage of generation 1.1.4 Five year CAGR of the ratio of TPEC to GDP 1.1.5 Days of oil and oil product stocks 1.1.6a For importers – Net fuel imports as a percentage of GDP 1.1.6b For exporters – Fuel exports as a percentage of GDP 1/6 Each
		1.2 Energy equity <b>25%</b>	1.2.1 Affordability of retail gasoline 1.2.2 Affordability and quality of electricity relative to access 1/2 Each
		1.3 Environmental sustainability <b>25%</b>	1.3.1 Total primary energy intensity 1.3.2 CO <sub>2</sub> intensity 1.3.3 Effect of air and water pollution 1.3.4 CO <sub>2</sub> grams/kWh from electricity generation 1/4 Each
	2. Contextual performance <b>25%</b>	2.1 Political strength <b>8.3%</b>	2.1.1 Political stability 2.1.2 Regulatory quality 2.1.3 Effectiveness of government 1/3 Each
		2.2 Societal strength <b>8.3%</b>	2.2.1 Control of corruption 2.2.2 Rule of law 2.2.3 Quality of education 2.3.4 Quality of health 1/4 Each
		2.3 Economic strength <b>8.3%</b>	2.3.1 Cost of living expenditure 2.3.2 Macroeconomic stability 2.3.3 Availability of credit to the private sector 1/3 Each



# 에너지 지수 – WEC Trillema Index



## 한국의 성적

Data: World Energy Council (2018.10.)

### A. Energy Performance : BAC

- Energy Security : 53위 (총 125개국 중)  
(15년 76위, 16년 72위, 17년 64위)
- Energy Equity : 17위  
(15년 38위, 16년 35위, 17년 26위)
- Environmental Sustainability : 92위  
(15년 89위, 16년 88위, 17년 84위)

### B. Contextual Performance : 27위

(15년 29위, 16년 28위, 17년 28위)

### Overall Ranking and Balance : 35위

(15년 46위, 16년 44위, 17년 39위)