SCI
SOLAR COOKERS INTERNATIONAL

United Nations Framework on the Convention for Climate Change (UNFCCC)

Nationally Determined Contributions with Emphasis on Solar Cooking

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This report was prepared by Solar Cookers International, a 501(c)3 organization based in Sacramento, CA, U.S.A. All data included was accurate as of 30 November 2018.

Data listed in this document was sourced from the UNFCCC NDC Database (http://www4.unfccc.int/ndcregistry/Pages/All.aspx) and was prepared by Michael Paparian, Solar Cookers International (SCI) Board Member, with SCI staff assistance from Shannon Watkins, SCI Communications Associate, and Caitlyn Hughes, SCI Executive Director.

Front Cover: members of Solar Cookers International and Centre for Rural Technology-Nepal pose in front of a solar cooker Performance Evaluation Process testing station.

Photo credit- Alan Bigelow, Solar Cookers International.

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Transition to clean, sustainable energy for cooking

As of 14 November 2018, 180 Nationally Determined Contributions (NDCs) have been submitted as part of the Voluntary National Review process for the United Nations Framework for the Convention on Climate Change (UNFCCC).

Nationally Determined Contributions (NDCs) can create transformational change in a nation's household energy plan by **including clean, sustainable cooking targets.**

3.09 billion people cook with biomass fuel (wood, charcoal, animal waste). Many NDCs include LPG in fuels goals; however, LPG is not a clean, sustainable cooking fuel, and continues the dependence on fossil fuels that contribute to climate change. This increases pressures on climate change adaptation and mitigation actions.

Solar thermal cooking is appropriate, accessible energy technology. These no-emission cooking technologies break the cycle of energy poverty. They are both adaptive and mitigating. They support a transition to clean, sustainable cooking.

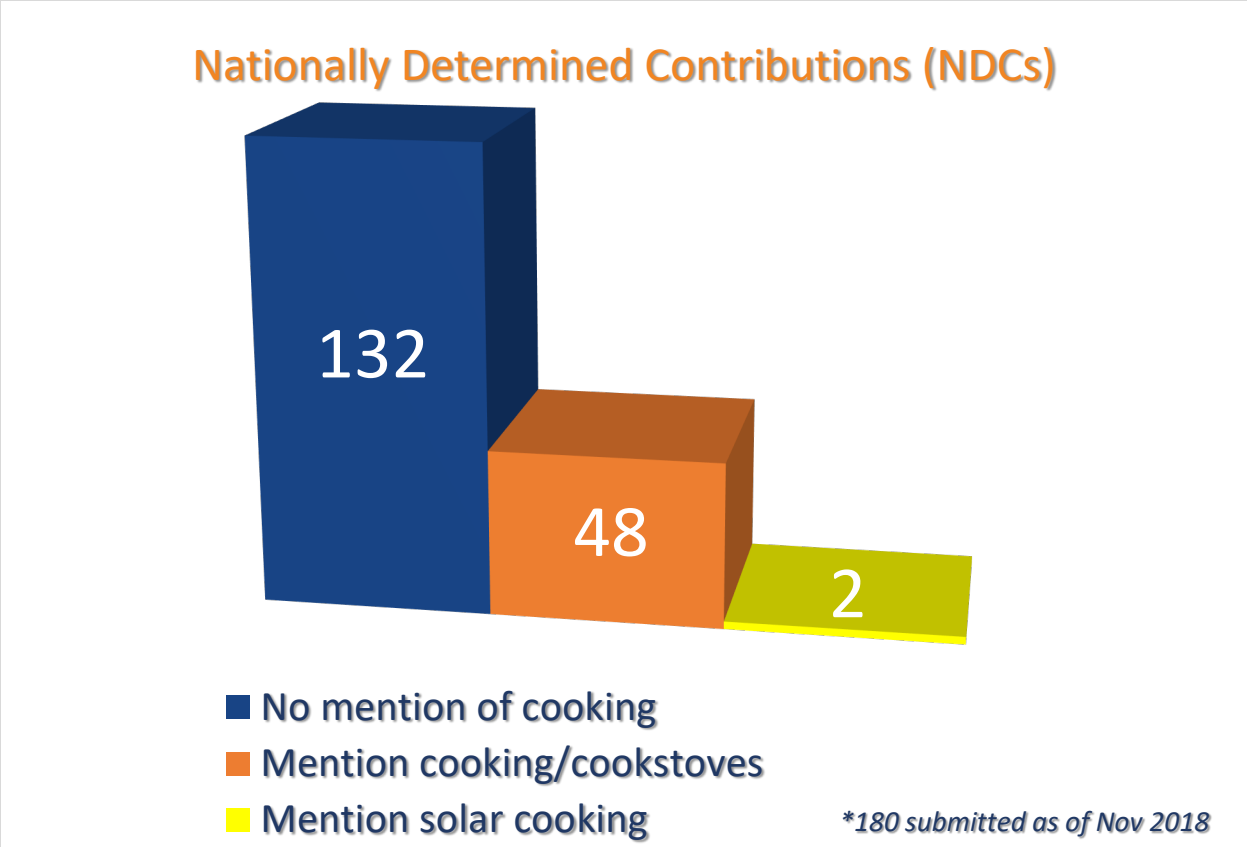
Since 1987, Solar Cookers International (SCI) has been harnessing solar energy to improve cooking conditions for millions of people in need and to improve the environment for all. Solar cooking technologies convert solar energy into heat energy for cooking food and making water safe to drink. For more information about SCI's mission, projects, or available data, email program@solarcookers.org.

The following pages highlight open opportunities to include clean, sustainable cooking in NDCs, by country.

Methodology

For purposes of this report, NDCs officially submitted by each party to the Paris Climate Change Agreement are examined. In most cases, Parties also submitted an "INDC" -- an Intended Nationally Determined Contribution. This report only reviews the final NDCs. Of the 197 parties to the Paris Agreement, 184 have officially ratified it; of these, the United Nations has posted (as of 14 Nov 2018) 180 finalized NDCs online: http://www4.unfccc.int/ndcregistry/Pages/All.aspx

Each submitted NDC was examined for references to cooking, cook, solar, stove, wood, LPG. Non-English submissions were translated using Google Translate and then examined carefully. Ambiguities in translation were checked more thoroughly, including referral to a speaker of the language. Selected relevant quotes from the submitted NDCs are included in this report.



Of 180 National Determined Contributions (NCDs) summitted to UNFCCC, forty-eight specifically mention cooking or cookstoves. Two additional NDCs (from Somalia and the Marshall Islands) have specifically included solar cooking as a sustainable approach.

Proposed NDC language for countries desiring to reduce CO_2 emissions:

Specific goals related to cooking

If the country goal is to reduce CO_2 emissions by reducing dependence on fossil fuels (LPG) and biomass (wood, charcoal, animal and crop waste) for cooking:

Transition from biomass and fossil fuel cook stoves to solar and electric cook stoves.

Broad goals related to cooking (institutional-scale), food processing and manufacturing

If the country goal is to reduce CO_2 emissions by reducing dependence on fossil fuels (LPG) and biomass (wood, charcoal, animal and crop waste) for institutional-scale cooking, food processing, and manufacturing:

Transition from biomass and fossil fuel energy to highly energy-efficient solar thermal energy and solar photovoltaic energy.

Country	Cookstove or Cooking Fuel Mentioned	Solar Cookstove Mentioned	Measurable Cookstove Goal	Encourages LPG or Fossil Fuel Cookstove solutions	Specific Discussion(s) of Cookstove or Related Goals/Issues Included in NDC
Afghanistan	✓				
Albania					
Algeria					
Andorra**					
Antigua and Barbuda	✓				
Argentina***					
Armenia					
Australia					
Austria*					
Azerbaijan					
Bahamas					
Bahrain					
Bangladesh	✓		✓	✓	Put in place policy mechanisms to incentivize the uptake of improved (more efficient) gas cookstoves; ... Support the replacement of biomass with LPG for cooking purposes; Goals: 70% market share of improved biomass cookstoves, reaching 20 million households in 2030 x 40% market share of improved gas cookstoves. x 10% market switch from biomass to LPG for cooking compared to the business as usual.
Barbados					
Belarus					
Belgium*					
Belize	✓		✓		Aim is to achieve a reduction of fuel wood consumption by 27%-66%, depending on the technology, the duration of cooking and the replacement technology.
Benin**	✓		✓		Promoting access 275,000 new households to facilities cooking using the domestic gas by subsidy of the acquisition of canister equipment.
Bhutan					
Bolivia					
Bosnia and Herzegovina					
Botswana					

Country	Cookstove or Cooking Fuel Mentioned	Solar Cookstove Mentioned	Measurable Cookstove Goal	Encourages LPG or Fossil Fuel Cookstove solutions	Specific Discussion(s) of Cookstove or Related Goals/Issues Included in NDC
Brazil					
Bulgaria*					
Burundi	✓				
Burkina Faso	✓		✓		The impacts and co-benefits of using the improved cook stove are enormous. The use of improved cook stoves permits households and other users to reduce their exposure to respiratory diseases caused by smoke or the inhalation of carbon dioxide or carbon monoxide, as the case may be. Persons previously exposed increase their health "capital" and the income previously devoted to health care is saved.
Cabo Verde	✓		✓		Cabo Verde also aims at eliminating three stone cooking stove (35% of households still use three-stone stove) through improved low-emissions cookstoves by 2025 at the latest, and thereby substantially removing demand for firewood.
Cambodia	✓				Promoting energy efficiency for buildings and more efficient cookstoves.
Cameroon**					Reduce the unsustainable consumption of fuelwood, for example by sustainable management of wood energy; promotion of biogas in rural areas.
Canada					
Central African Republic	✓				Promote the use of improved cook stoves.
Chad					
Chile	✓				Main sources of black carbon in Chile come from diesel transport, heating and residential wood fired cooking. Black carbon, which is considered a SLCP, accounts for a substantial part of the particulate (PM2. 5) measured in Chilean cities. Main sour-ces of black carbon in Chile come from diesel transport, heating and residential wood fired cooking.
China					
Columbia					
Comoros**	✓		✓	✓	Promote the use of LPG instead of oil and Wood. Promote improved stoves.

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Congo**	✓		✓		Extend the use of improved stoves (20% in 2025 and 50% in 2035).
Cook Islands					
Costa Rica					
Croatia*					
Côte d'Ivoire**	✓				Popularizing construction and use of improved stoves in rural areas.
Cuba***					
Cyprus*					
Czech Republic*					
Democratic Peoples Republic of Korea (North)	✓				To use biogas from livestock manure and domestic sewage instead of coal or firewood for cooking. To replace conventional coal stoves for cooking with efficient electric cookers at the households.
Democratic Republic of the Congo**					
Denmark*					
Djibouti	✓		✓	✓	Decrease the consumption of wood for cooking, estimated at 56,100 tonnes each year, through the replacement of 1,000 units by systems that use LPG.
Dominica					
Dominican Republic					
Egypt					
El Salvador***					
Eritrea	✓		✓		As adaptation strategy, the government of Eritrea has already taken concrete measures to introduce energy saving cooking stoves for rural households. These stoves have efficiency of about 26% compared to the traditional ones with 10%. Besides reducing the pressure on the forest resources, the advantages of these stoves lie in the use of waste biomass as well as in securing the health and wellbeing of women and children.
Estonia*					

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Eswatini					
Ethiopia	✓		✓		One of the priority initiatives under the Climate Resilient Green Economy is the use of more efficient stoves, amounting to an emissions reduction rate of 50 MtCO2e per year by 2030.
European Union					
Fiji	✓				Biomass/wood for cooking in rural areas is one of the three main energy uses in Fiji.
Finland*					
France*					
Gabon**					
Gambia	✓		✓		Efficient Cook-stoves; reduce firewood and charcoal consumption and the overuse of forest resources.
Georgia					
Germany*					
Ghana	✓		✓	✓	Scale up adoption of LPG use from 5.5% to 50% peri-urban and rural households up to 2030. Scale up access and adoption of 2 million efficient cook stoves up to 2030.
Greece*					
Grenada					
Guatemala***					
Guinea	✓		✓		Organization of local industrial supply chains to enable the introduction of at least 1 million improved stoves. Support the dissemination of technologies and practices that are energy efficient or use alternatives to wood energy and charcoal.
Guyana	✓				Encourage the use of bio-digesters to reduce waste, produce biogas and provide affordable, healthy and efficient cooking means at the household level.
Haiti**	✓				Promote the use of energy-efficient stoves in replacement of traditional fireplaces (energy savings of 25-30% per warming).

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Honduras***					Reduce firewood consumption by 39% in families, helping in the fight against deforestation.
Hungary*					
Iceland					
India	✓				About 30% of the global population relies on solid biomass for cooking. The 'Give It Up' Campaign was launched to encourage citizens to give up the subsidy on cooking gas to meet the needs of the truly needy citizens, thereby promoting a shift away from inefficient use of biomass in rural areas.
Indonesia					
Ireland*					
Israel					
Italy*					
Jamaica					
Japan					
Jordan					
Kazakhstan					
Kenya					
Kiribati	✓				Greenhouse gas emissions are the result of combustion of imported fossil fuels in the Kiribati energy sector for [multiple purposes, including] LPG and kerosene for cooking.
Kuwait					
Lao PDR					
Latvia*					
Lesotho	✓		✓	✓	Replacement of fuel-wood with LPG at the rate of 10% a year from 2020 to 2030. Dissemination of efficient biomass cook-stoves and efficient biomass space heating stoves.

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Liberia	✓		✓		Produce and distribute 280,543 energy saving cook stoves that use fuel wood and 308,004 energy saving cook stoves that use charcoal by 2030.
Liechtenstein					
Lithuania*					
Luxembourg*					
Madagascar	✓		✓		Disseminate improved stoves (by 2030: 50% of households adopting improved stoves).
Malawi	✓		✓		Promote use of bio-fuels for lighting and cooking replacing fossil based fuel. Distribute energy saving cook stoves to 400,000 households.
Malaysia					
Maldives					
Mali**	✓				
Malta*					
Marshall Islands	✓	✓	✓		Transition to electric and solar cook stoves from LPG cook stoves. All CO2 emissions are the result of combustion of imported fossil fuels in five sectors including LPG, butane and kerosene for cooking.
Mauritania**					
Mauritius					
Mexico					
Micronesia					
Monaco					
Mongolia	✓				Reduce fuel use in individual households through improving stove efficiency (with a co-benefit of air pollution reduction).

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Morocco	✓		✓		Distribution of ... 6,000 cook stoves per year between 2016 and 2030 to reduce forest fuel wood consumption when compared to traditional cook stoves, to provide for coastal side inhabitants' cooking and eating needs.
Mozambique					
Myanmar	✓		✓		To increase the number of energy efficient cook-stoves disseminated in order to reduce the amount of fuel wood used for cooking. Indicative goal: To distribute approximately 260,000 cookstoves between 2016 and 2031.
Namibia					
Nauru					
Nepal	✓		✓		Equip every households in rural areas with smokeless (improved) cooking stoves (ICS) by 2030. Target of 475,000 improved cookstoves.
Netherlands*					
New Zealand					
Niger	✓		✓		Cooking energy: reduction in the demand for wood energy per inhabitant by the mass spread of improved cook stoves, with a rate of penetration of 100% in urban areas and 30% in rural areas; promotion as domestic gas of biogas and biofuels at both the industrial and family level.
Nigeria	✓			✓	Those who rely on fuel wood and charcoal for cooking and heating, primarily women, are exposed to serious indoor air pollution. Providing affordable clean alternatives is the only way forward. To what extent the use of LPG – a fossil fuel – delivers a genuine climate benefit, compared to wood-based charcoal, needs to be considered.
Niue	✓				Fuel substitution for transport and cooking.
Norway					

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Pakistan	✓				Mitigation Options in Energy Demand Sector- efficient stoves are: very cheap; very large impact, provides tangible and visible benefits to a very large portion of population; per device cost is significantly low.
Palau					
Panama***					
Papua New Guinea					
Paraguay***					
Peru					
Poland*					
Portugal*					
Qatar					
Republic of Korea (south)					
Republic of Moldova	✓				Establishment of plantation forests to meet the population's needs of fuel wood for heating, cooking etc.
Romania*					
Rwanda	✓		✓	✓	Given the fact that poor performing cook stoves are still used in most cases leading to inefficiencies in fuel consumption and health effects, Rwanda intends to increase the diffusion of improved cook stoves and reach 100% of all households in needs 2030. Rwanda will enhance the use of LPG through tax reductions on importations.
Saint Kitts and Nevis					
Saint Lucia					
Samoa					
Sao Tome and Principe					
Saudi Arabia					
Serbia					
Seychelles					
Sierra Leone	✓				Expanding clean energy utilization (e.g. solar, mini-hydro electric power, LPG, biomass stoves, etc.).
Singapore					

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Slovakia*					
Slovenia*					
Solomon Islands					
Somalia	✓	✓			Solar cooking has also seen some uptake in the country. Accelerated diffusion of energy efficient cook-stoves for reduction in charcoal consumption.
South Africa					
Spain*					
Sri Lanka					
St. Vincent and the Grenadines					
State of Palestine					
Sudan				✓	The carbon balance and incentives for energy substitution to LPG.
Sweden*					
Switzerland					
Tajikistan					
The United Republic of Tanzania				✓	Expanding the use of natural gas for power production, cooking, transport and thermal services through improvement of natural gas supply systems throughout the country.
Thailand					
Timor-Leste	✓				In Timor-Leste, 95% of households use firewood for cooking and 83% cook over open fire. The use of firewood and inefficient traditional stoves are posing serious public health, socio-economic, and environmental consequences for the people.
Togo	✓				Produce and popularize energy-efficient stoves using wood, charcoal and gas among all of the country's social strata (a process that will need to begin with subsidies or appropriate tax benefits).
Tonga					
Tunisia					
Turkmenistan					

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Tuvalu					
Uganda	✓				Promotion and wider uptake of energy efficient cooking stoves or induction cookers.
Ukraine					
United Arab Emirates					
United Kingdom*					
United States					
Uruguay					
Vanuatu					
Venezuela***					
Vietnam					
Zambia	✓			✓	Improved cooking devices to include improved biomass stoves, use of ethanol and LPG stoves, and switch to electric stoves.
Zimbabwe					
Totals	**48**	**2**	**23**	**10**	

* part of the European Union (EU) joint submission

** Original report in French

*** Original report in Spanish