3. The following are contributions of the PoA to sustainable development:

Environmental sustainability

(i) The programme reduces the use of non-renewable biomass:

In Latin America, and in particular Guatemala, the consumption of non-renewable biomass for energy generation has been growing for the past 30 years. More than a quarter of forest production in Latin America goes towards firewood production.[4]

By adopting the higher efficiency ONIL Stove, households reduce the quantity of fuel wood they must consume for daily cooking needs. Independent laboratory test (Annex 3) shows that when compared to firewood consumption of conventional open fires, the ONIL Stove on average reduces firewood consumption by 58 percent.[5] Since a very high proportion of fuel wood comes from non-renewable sources,[6] this translates directly into reduced emission reductions from non-renewable extraction of wood. For example, it is estimated that every stove will, on average, save 3.837 tons of carbon dioxide equivalent in each year of its operation. Thus, the PoA lowers the Greenhouse Gas (GHG) Balance for the country.

(ii) The programme also supports the objectives of national climate change policies and programs.

The *Programa Nacional de Cambio Climatico* (PNCC) within the Environment Ministry of Guatemala is charged with assessing the risks of climate change and recommending policies to reduce the country's vulnerabilities. The PoA is in line with the PNCC aim of generating projects within Guatemala that promote forest management, a critical and vulnerable sector identified by the Program.[7] By installing improved cook stoves, households reduce firewood consumption, thus helping maintain forest stocks within the country.

The PoA also supports the "Climate Change Studies in Guatemala with Emphasis on Adaptation Project" which has the specific objectives of:

- Strengthening key players (of community) and local and regional institutions.
- Supporting forestry and agroforestry projects with the potential for removing carbon.
- Incorporating the subject of climate change into the region's agenda.[8]

(iii) The programme produces real and measurable reductions in GHG emissions:

The programme will utilize the approved methodology, AMS II.G, version 3, "*Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass*", to ensure that all measurements of greenhouse gas emission reductions are robust, conservative and verifiable. The programme will maintain high standards of monitoring to ensure that all emission reductions claimed are measurable and real.

Economic Sustainability

(i) The programme reduces household expenditures:

The PoA will contribute significantly to Guatemala economic sustainability through the more efficient use of firewood. Energy savings at both individual household and national levels make important contributions to their economic efficiency and sustainability. As shown in laboratory test, the use of the ONIL Stoves will reduce firewood consumption by approximately 58 percent from baseline consumption, significantly reducing household expenditures.

According to World Bank reports, in 2000 approximately 56 percent of the population or 6.4 million people in Guatemala lived in poverty. About 16 percent of the population lives in extreme poverty, and of those classified as "poor", 79 percent are chronically poor.[9] The majority of these households live in the countryside or rural areas. By installing improved cook stoves, these households would save significantly on household expenditures related to firewood purchases along with saving time spent gathering firewood, which would free up time for households for other income generating activities. These savings would help improve living conditions for households in Guatemala.

(ii) The programme results in creation of new jobs and development of new skill sets:
The ONIL Stove distribution program, which all CPAs will follow, relies on community organizers to facilitate demonstrations and organize training sessions. As these community organizers increase their knowledge about stoves, they often become professional installers and help maintain the stoves in their community. In addition, there are two stove-manufacturing facilities in Guatemala that employ about 20 people each. As uptake of stove technologies spreads, it will allow for expansion of manufacturing facilities to meet increased demand, thus generating more employment opportunities within the country.

Social Sustainability
The programme helps to improve health conditions:
There are very tangible and significant health benefits associated with the switch in technology from conventional open fires to improved cook stoves as well. Traditional cooking methods involve conventional open fires that result in the emissions of local pollutants such as carbon monoxide and particulate matter in often poorly ventilated rooms, which lead to respiratory problems. In addition, conventional open fires are frequent causes of burns and other injuries. Switching from conventional open fires to ONIL Stoves reduces the incidence of such injuries and health problems.

Through demonstration, training and implementation, the PoA will also generate a range of less tangible social outcomes in education and awareness. This programme will build awareness of the health problems associated with conventional open fires traditionally used for cooking and create an opportunity for collective action on climate change, enhancing a sense of community, and empowering individual households.

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[4] UNEP (2003): GEO Latin America and the Caribbean: Environment Outlook 2003. www.unep.org/geo/pdfs/GEO__lac2003English.pdf

[5] The Aprovecho Test results (Annex 3 and page 2 of report) show a hot start efficiency of 26%, which signify increased efficiency of 62% and a cold start efficiency of 20%, translating to 50% improved efficiency. Taking into account cooking behaviour, which includes one cold start in the morning and two hot starts throughout the day, the weighted average stove efficiency of 24%, which translates to 58% increased efficiency for the stove.

[6] See calculation in section E.6.3.

[7] wikiadapt.org/index.php?title=Methodology_of_Guatemala_NCAP_Project

[8] Ministry of the Environment and Natural Resources and National Climate Change Programme Guatemala (2004): "Climate Change Studies in Guatemala with emphasis on Adaptation".

[9] World Bank (2003): Poverty in Guatemala, p. 2, bit.ly/9M40Lq