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**Clean cookstoves and clean cooking solutions — ~~Guidance~~ —
Guidelines for social impact assessment**

WD

Fourneaux et foyers de cuisson propres — Lignes directrices pour l'évaluation de l'impact social

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FDIS stage DTR 19915

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Foreword

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This document was prepared by Technical Committee ISO/TC 285, *Clean cookstoves and clean cooking solutions*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document ~~technical report (TR)~~ provides guidance ~~and orientation~~ for assessing social impacts. It illustrates social impacts deriving from improved cooking and inspires the implementation of such assessments. This document is not exclusive ~~and nor~~ comprehensive but provides a solid basis for an assessment. It is important to note that these guidelines are limited by the fact that social impact assessments have been carried out over a limited time and in limited number. Therefore, the guidelines can be considered ~~as an evolving orientation in evolution.~~

By social impacts, it is meant consequences to human populations (which can be viewed as harmful or beneficial by those impacted) of any public or private actions related to the adoption of improved cooking solutions that alter and affect the ways in which people live, work, play, relate to one another, and organize to meet their needs as members of ~~the~~ society (men, women, boys, girls, all ages, and all genders). The term also includes cultural impacts involving changes to cooking habits, ~~the~~ norms, values, and beliefs that guide and rationalize their cognition of themselves and their society.^[98-101]

The social impacts this document currently reflects are socio-economic impacts (e.g. gender impacts, employment, entrepreneurship, ~~and~~ economic impacts, time use and perception of well-being), health impacts (e.g. accidents and safety, exposure to smoke and resulting health effects, and food security), and environmental impacts. The impact hypotheses however might appear rather linear, even though in reality they are not. This simplified presentation is for illustrative purposes.

This document is a companion to the International Standard for ~~Harmonised Laboratory Testing~~ harmonised laboratory testing (ISO 19867) (describing procedures to analyse and characterize the performance of a technology under laboratory conditions) and to the International Standard for ~~Field Testing Methods~~ field testing methods (ISO 19869) (describing procedures to analyse and characterize the performance of the entire cooking energy system including user behaviour and cooking location in real settings). This document describes procedures to analyse and characterize the impacts people experience after improving their cooking energy system.

Impacts result from the adoption and consistent use of the improved cooking energy system; guidance on assessing adoption and use is provided in ISO 19869.

Stove and fuel stacking is a common practice, in which households use various stoves and fuels for specific purposes and cooking tasks. Households commonly adopt an improved cookstove as one cooking tool among others that can accommodate several cooking methods and fuels. This practice can limit or change the intended impacts of a cooking intervention.

~~Clean cookstoves and clean cooking solutions~~ — **Guidance for social impact assessment**

~~1~~ **Scope**

~~This document gives a guidance to evaluate and assess the social impact of improved cooking energy systems.~~

~~This document is an informative document, which provides orientation in terms of:~~

- ~~— considerations for stakeholders involved in the cooking sector;~~
- ~~— background information regarding various social impacts resulting from cooking systems;~~
- ~~— example results chains illustrating the simplified and aspirational causal linkages related to energy transitions; and~~
- ~~— descriptive tools and methods to measure direct and indirect social impacts.~~

~~The target group for this document is any stakeholder interested in evaluating the impacts of improved cooking; such as, researchers, development organisations, non-governmental organisations, government bodies private sector companies, and donor or investors.~~

~~Normative references~~ There are no normative references in this document.

~~Terms and definitions~~ For the purposes of this document, the following terms and definitions apply.

~~ISO and IEC maintain terminology databases for use in standardization at the following addresses:~~

~~— ISO Online browsing platform: available at~~

~~IEC Electropedia: available at~~ This document refers to a solution called “improved cooking energy system” or “improved cookstove”. The term “improved” was chosen as it is generic and inclusive: it includes fuel saving and efficiency, usability, durability, etc. In contrast, the term “clean cookstoves” or “clean cooking solution” does not encompass all issues that are trying to be resolved in the sector. For instance, it does not address efficiency/fuel savings nor include significant social impacts that are, at times, the determining decision factors (besides smoke reduction, comfort, time saving, etc.) that move households to decide to buy and use technologies and change their cooking habits. Therefore, this document uses the term “improved.”

Furthermore, a cookstove alone does not change the cooking reality of families and does not generate all intended impacts. Therefore, this document considers the entire “cooking energy system,” which is a term that reflects and acknowledges the following impact-influencing factors: fuel properties, user behaviour, cooking practice, cooking location and ventilation as well as cooking utensils. Working towards including all these factors will provide the expected benefits.

Clean cookstoves and clean cooking solutions — Guidelines for social impact assessment

1 Scope

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— considerations for stakeholders involved in the cooking sector;

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— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

agency

ability to define one's goals and act upon them

[SOURCE: ISO/TR 21276:2018, 3.6.2]

3.2

baseline

status of a market or a community prior to introduction of improved cooking energy systems, described by measurements and metadata derived from the field

[SOURCE: ISO/TR 21276:2018, 3.3.1, modified — The phrase “community or cooking system” has been replaced by “community”, and “prior to intervention” has been replaced by “prior to introduction of cooking energy systems”.]

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33 **3.3**
34 **cooking system**
35 combination of *cookstove* (3.5), fuel, cooking equipment, cooking environment (including
36 ventilation), and user behaviour, which all influence the quality of the cooking energy service
37 provided

38 [SOURCE: ISO/TR 21276:2018, 3.5.4, modified — The phrase “and user behaviour, which all
39 influence the quality of the cooking energy service provided” has been added.]

40 **3.4**
41 **cooking time**
42 total time of cooking a dish; it is the time difference between finishing time minus starting time of
43 cooking (in minutes)

44 [SOURCE: Reference [19 [49]] modified — The ~~formula~~ formula $\Delta t = t_f - t_i$ was translated into the
45 phrase “total time of cooking a dish; it is the time difference between finishing time minus starting
46 time of cooking (in minutes)”, with t_i being start time and t_f being finish time of cooking (minutes)].

47 **3.5**
48 **cookstove**
49 appliance primarily employed for the cooking of food, but which can also be employed for space or
50 water heating, or other purposes

51 [SOURCE: ISO/TR 21276:2018, 3.1.7]

52 **3.6**
53 **DALY**
54 disability-adjusted life year
55 loss of the equivalent of one year of full health

56 Note 1 to entry: DALYs for a disease or health condition are the sum of the years of life lost to due to premature
57 mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health
58 condition in a population.

59 [SOURCE: Reference [112 [42]] modified — Note 1 to entry was originally part of the definition.]

60 **3.7**
61 **economic impact**
62 net change in an economic activity associated with an industry, event, or policy in an existing
63 regional economy

64 Note 1 to entry: These changes are most often viewed in terms of business output, value added, wealth,
65 personal income, or jobs.

66 [SOURCE: ISO/TR 21276:2018, 3.6.3, modified — The phrase “net change, either positive or
67 negative, in an economic activity” has been replaced by “net change in an economic activity”, and
68 “including industrial output, value added, wealth, personal income, jobs and resources” has been
69 replaced by “associated with an industry, event, or policy in an existing regional economy”. Note 1
70 to entry was originally part of the definition.]

71 **3.8**
72 **employment**
73 occupation for which people are paid either in cash or in kind

74 Note 1 to entry: Persons who during a specified brief period, (a) performed some work for wage or salary in
75 cash or in kind, (b) had a formal attachment to their job but were temporarily not at work during the reference

76 period, (c) performed some work for profit or family gain in cash or in kind, (d) were with an enterprise such
 77 as a business, farm or service but who were temporarily not at work during the reference period for any
 78 specific reason.

79 [SOURCE: ISO/TR 21276:2018, 3.6.4, modified — Note 1 to entry was added.]

80 3.9

81 empowerment

82 process of expansion in people's ability to make strategic life choices in a context where this ability
 83 was previously denied to them

84 Note 1 to entry: Empowerment is comprised of the following dimensions: resources, *agency* (3.1(3.4)) and
 85 achievements. Resources is defined as the necessary skills and information; achievement is defined as the
 86 outcomes of the empowerment process.

87 [SOURCE: ISO/TR 21276:2018, 3.6.5, modified — Note 1 to entry was added.]

88 3.10

89 entrepreneur

90 person who seeks to generate value through the creation or expansion of economic activity, by
 91 identifying and exploiting new products, processes or markets

92 [SOURCE: ISO/TR 21276:2018, 3.6.6]

93 3.11

94 environmental impact

95 positive, neutral or negative effect on the social or material environment in a given area resulting
 96 from a change

97 [SOURCE: ISO/TR 21276:2018, 3.6.7]

98 3.12

99 exposure

100 contact of an organism with chemical, biological or physical influences

101 Note 1 to entry: This contact can occur via mouth (e.g. by food), the respiratory system or skin.

102 [SOURCE: ISO/TR 21276:2018, 3.4.4, modified — The phrase “physical or biological agent at levels
 103 above those normally found in the organism's environment” has been replaced by “biological or
 104 physical influences” ~~and~~ Note 1 to entry was added.]

105 3.13

106 food security

107 point in time, when all people, at all times, have physical and economic access to sufficient, safe and
 108 nutritious food that meets their dietary needs and food preferences for an active and healthy life

109 [SOURCE: ISO/TR 21276:2018, 3.6.8, modified — The term “condition” was replaced by “point in
 110 time” and “for an active and healthy life” was added.]

111 3.14

112 gender

113 socially constructed roles and responsibilities of women and men in society and the power relations
 114 that exist between them

115 Note 1 to entry: The concept of gender also includes the expectations held about the characteristics, aptitudes
 116 and likely behaviours of both women and men (femininity and masculinity). Gender roles and expectations
 117 are learned. They can change over time and they vary within and between cultures. Systems of social

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118 differentiation such as political status, class, ethnicity, physical and mental disability, age and more, modify
119 gender roles ~~1105140611~~.

120 Note 2 to entry: The concept of gender is vital because, applied to social analysis, it reveals how women's and
121 men's roles and relationships are largely socially constructed. In most societies, there are differences and
122 inequalities between women and men in decision-making opportunities, responsibilities assigned, activities
123 undertaken, and access to and control over resources.

124 [SOURCE: ISO/TR 21276:2018, 3.6.9, modified — The phrase “culturally and socially
125 constructed” has been replaced by “socially constructed” and “of different sexes that exist in
126 families,

127 ~~Societies, societies~~ and cultures, and the power relations that exist between different sexes” has
128 been replaced by “of women and men in society and the power relations that exist between them”.
129 ~~Note/Notes~~ 1 and 2 to entry were added~~-.]~~

130 3.15

131 HICs

132 HIC

133 high income ~~countries~~ ~~country~~
134 ~~economies~~ ~~economy~~ with a gross national income per capita of \$13 206 ~~USD~~ or more

135 [SOURCE: Reference ~~44~~ ~~420~~] modified — The abbreviation “GNI” has been replaced by
136 “~~economies~~ ~~economy~~ with a gross national income”~~].]~~

137 3.16

138 HAP

139 household air pollution

140 presence of air pollutants including solid particles or gases in air in both indoor and outdoor
141 environments of living spaces

142 [SOURCE: ISO 19869:2019, 3.4.9]

143 3.17

144 improved cookstove

145 ~~cookstove~~ ~~(3.5)~~ proposed for a geographic region or target community, which has been shown to
146 outperform a ~~baseline~~ ~~(3.2)~~ with respect to primary criteria including emission factors, fuel
147 consumption, thermal efficiency, durability, and/or safety

148 [SOURCE: ISO/TR 21276:2018, 3.1.9]

149 3.18

150 livelihood

151 capabilities, assets, income and activities required to obtain the necessities of life

152 Note 1 to entry: People pursue a variety of livelihood outcomes ~~(~~ ~~such as more income, increased well-being~~
153 ~~(3.28)~~ ~~,~~ reduced vulnerability, improved ~~food security~~ ~~(3.13)~~ ~~)]~~ through various livelihood strategies.
154 Livelihood strategies aim to build or contribute to an individual's livelihood assets- comprised of human
155 capital, natural capital, financial capital, physical capital, social capital, and political capital.

156 [SOURCE: ISO/TR 21276:2018, 3.6.11, modified — Note 1 to entry was added.]

157 3.19

158 LMICs

159 low and middle income countries

160 economies with a gross national income per capita of less than \$13 205 ~~USD~~

161 [SOURCE: Reference [\[120\]](#) modified — The abbreviation “GNI” has been replaced by
162 “economies with a gross national income”]

163 3.20

164 PM_{2,5}

165 particulate matter with diameter of 2,5 micrometers (µm) or less

166 [SOURCE: ISO/TR 21276:2018, 3.4.8, modified — The phrase “fine particulate matter such that the
167 aerodynamic equivalent diameter of the particles is less than or equal to 2,5 µm” has been replaced
168 by “particulate matter with diameter of 2,5 micrometres (µm) or less”.]

169 3.21

170 quality of life

171 individuals’ objective and perceived position in life in the context of culture and value systems in
172 which they live, including personal security, physical and mental health, education and skills,
173 environmental quality, social connections, civic engagement and governance, as well as recreational
174 and leisure time

175 [SOURCE: ISO/TR 21276:2018, 3.6.12, modified — The phrase “and in relation to their goals,
176 expectations, standards and concerns, and the sum of the above as expressed in their community”
177 has been replaced by “including personal security, physical and mental health, education and skills,
178 environmental quality, social connections, civic engagement and governance, as well as recreational
179 and leisure time”.]

180 3.22

181 results chain

182 causal chain

183 description of steps that can result from an intervention, defined as inputs, activities, outputs,
184 outcomes (direct results) and impacts (indirect results)

185 [SOURCE: Reference [\[21\]](#) modified — The phrase “The causal sequence for a development
186 intervention that stipulates the necessary sequence to achieve desired objectives beginning with
187 inputs, moving through activities and outputs, and culminating in outcomes, impacts, and feedback.”
188 ~~Has~~ has been replaced by “description of steps that can result from an intervention, defined as
189 inputs, activities, outputs, outcomes (direct results), and impacts (indirect results)”.]

190 3.23

191 self efficacy

192 belief that one will be able to accomplish the things he/she sets out to do

193 [SOURCE: Reference [\[52\]](#) modified — The phrase “beliefs have the potential to influence imagery,
194 outcomes and can show if an intervention has had an effect.” ~~Has~~ has been replaced by “belief that
195 one will be able to accomplish the things he/she sets out to do”.]

196 3.24

197 social impact

198 positive and negative consequences of any actions to improve cooking that can alter or affect the
199 ways in which people live

200 [SOURCE: ISO/TR 21276:2018, 3.6.13]

201 3.25

202 stacking

203 common practice in which households use various stoves and fuels for specific purposes and cooking
204 tasks

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[SOURCE: ISO/TR 21276:2018, 3.5.13, modified — The original term was "stove stacking" and the phrase "practice of a household using more than one cookstove" was replaced by "common practice in which households use various stoves and fuels for specific purposes and cooking tasks".]

3.26 stakeholder

organization, government, company, researcher, user and/or community involved in *cooking system* (3.3) research, design, development, production, sale, promotion, regulation, and/or use

[SOURCE: ISO/TR 21276:2018, 3.5.13.6.14, modified — The phrase "those involved in the development of clean cookstoves" was replaced by "organization, government, company, researcher, user and/or community involved in cooking system research, design, development, production, sale, promotion, regulation, and/or use".]

3.27 time use

time spent on fuel procurement and preparation, food preparation, cooking, cleaning, and stove tending, as well as shifts in time and activity patterns, including among household members

Note 1 to entry: This includes both perceived changes and actual measured shifts in how people spend their time.

Note 2 to entry: Adapted from ISO/TR 21276:2018, 3.3.24.

3.28 well-being

dynamic process that gives people a sense of how their lives are going as a result of the interaction between their circumstances, activities and psychological resources or 'mental capital'

Note 1 to entry: It includes objective and subjective factors.

Note 2 to entry: Adapted from ISO/TR 21276:2018, 3.6.17 and Reference [100[400]].

4 Impacts

4.1 General

Around the world, ~~3~~^{three} billion people rely on open fires and traditional cookstoves and fuels to cook food and to light and heat their homes – causing serious environmental and health problems ~~110[440]~~. Over ~~4~~^{four} million people globally die each year from exposure to household air pollution caused by cooking fires ~~110[440]~~. Scaling the adoption of clean and efficient cookstoves and fuels is imperative to ending energy poverty. Increasing access to and the adoption and consistent use of clean and efficient cookstoves and fuels has the potential to contribute to the achievement of UN Sustainable Development Goals (SDGs) related to poverty eradication, food security, health and well-being, education, gender equality, economic growth, reducing inequalities, sustainable cities, environmental protection, and climate change mitigation ~~101.97[401, 97]~~. Stakeholders can consider including an assessment of adoption and usage as a central component of their impact evaluations (for guidance, see ISO 19869).

4.2 Gender impacts

Stakeholders can consider the potential positive, negative, or neutral gender impacts to individuals and households from the adoption of an alternative cooking energy system, given that women and girls generally perform an overwhelming majority of the cooking tasks, and in most contexts, are responsible for managing household energy, including collecting or purchasing fuel. These impacts can concern health, safety, economic circumstance, education, household energy, time use, and/or

248 quality of life. Knowing that these factors overwhelmingly impact the lives of women and children,
 249 a gender analysis can be undertaken to capture gender and power dynamics in a given context or
 250 intervention. (See [Table 1](#) ~~Table 1~~ for gender analysis and implementation resources and
 251 [Table 2](#) ~~Table 2~~ for guidance on gender impact assessment.)

252 NOTE 1 : It is important to consider different roles and responsibilities played by women, men, and
 253 children in and outside the household that could be affected by cookstove interventions. For instance, women
 254 often shoulder the burden of caregiver responsibilities. Roles can also be viewed across the entire cooking
 255 value chain (including design, production, marketing, sales, distribution, and use). Assessing both the extent
 256 and quality of these roles is important (such as access and control/ownership of resources, the ease of access
 257 to credit and loans, leadership, and decision-making opportunities, paid and unpaid ~~labor~~labour, domestic
 258 duties and care, etc.).

259 NOTE 2 : The assessment can consider any policies that are enacted to ensure or foster gender equality and
 260 a conducive working environment for women (such as issues of maternity and paternity leave, flexible
 261 working hours, consideration of work/life balance, equal salary/wages, opportunities for training,
 262 mentorship, and promotion, sexual harassment policies, health care, etc.).

263 NOTE 3 : The assessment can consider the gendered household, social, and economic impacts of alternative
 264 cooking energy system adoption (such as household finances, time use, gender norms and workload, health,
 265 the impacts of drugger, injuries, accidents, harassment, and the risk of violence).

266 4.3 Socioeconomic impacts

267 4.3.1 Household finance, employment, and enterprise

268 Stakeholders can consider the potential positive, negative, or neutral economic impacts to
 269 individuals and households from the adoption of alternative cooking energy systems. Possible
 270 impacts include household economic shifts from reduced fuel expenditure or changes in income-
 271 generating opportunities.

272 NOTE 1 : Changes in the money spent on fuel is a common direct impact resulting from the adoption and
 273 use of improved stoves in some contexts. Not only do the prices of various fuels differ (including free
 274 fuelwood), but depending on the fuel efficiency of the cookstove, less or more fuel can also be required ~~[3]~~.
 275 (See [Table 3](#) ~~Table 3~~ for resources on economic impact assessment.)

276 NOTE 2 : Shifts in fuel expenditures are also dependent on how consistently the family uses the improved
 277 cooking energy system, whether they are using it correctly, and whether they are using it in place of other
 278 cooking energy system or in combination with other cooking technologies ~~[3]~~ ~~[43]~~ ~~1~~.

279 NOTE 3 : While more efficient cooking can reduce fuel costs, such advantages could be offset by the added
 280 costs or investment required for the purchase of new cookstoves, including the burden of credit/finance. For
 281 instance, the adoption of new cookstove technologies and fuels can greatly shift household costs in terms of
 282 cash flow and time.

283 EXAMPLE : If a family borrows money to buy a liquefied petroleum gas (LPG) stove to replace or
 284 supplement a cookstove that burns collected wood fuel, they could experience a reduction in their cash
 285 resources in order to pay back the credit and refill their LPG cylinder but also an increase in time for productive
 286 or leisure activities, as they no longer have to collect as much wood.

287 NOTE 4 : Product design, production, distribution, and after-sales service of cooking energy systems can
 288 encourage new skills and retraining, as well as the potential creation of businesses, entrepreneurship, and
 289 employment opportunities.

290 NOTE 5 : The adoption of alternative cooking energy systems could negatively impact the livelihoods of
 291 people involved in the distribution of existing stoves and fuels. This could include job losses, lower profit
 292 margins, or disruptive effects of importing products. The opportunity to access, use and manage credit can be
 293 considered.

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NOTE 6 — It is also important to consider skills and knowledge gained as well as traditional or indigenous knowledge lost because of the introduction of alternative cooking energy systems. These can relate to technical skills related to cooking or the production and use of fuel, as well as knowledge related to health and environmental impacts of cooking practices. The extent and quality of training activities can also be considered.

4.3.2 Time use

Stakeholders can consider that in LMICs, household members typically spend long days balancing a variety of responsibilities that are integral to the family's survival. Cooking and related fuel collection and preparation tasks are commonly integrated into long days of unpaid care work, such as caring for children, tending to animals and crops, fetching water, washing clothes and other cleaning tasks. In general, while not universally true, these responsibilities and their impacts fall most heavily on women and female children.

Stakeholders can consider the ways in which changes in cooking technology, fuel, or practices (alone or in combination) impact household time use, whether through time savings, increased time expenditures, or balance-neutral transference of time among activities and/or household members. (See [Table 4](#) on methods for collecting time use data.)

NOTE 1 — Cooking-related activities and fuel-related activities are sometimes performed by distinct household members, with the division often determined by gender and/or age.

NOTE 2 — These activities often occur on quite separate time scales, with cooking performed at least once per day year-round, while fuel procurement could be undertaken less frequently, and patterns could vary significantly across seasons. The frequency and duration of these activities are affected by very different factors, and how time is allocated and prioritized can vary at different times of the year.

EXAMPLE 1 — Fuel collection can be a function of forest cover, whereas cooking time can be a function of food preparation (like pre-soaking beans). During agricultural harvesting seasons, women could have less time for fuel collection due to increased farming responsibilities and could need to collect more fuel before this time period to have a sufficient stock.

NOTE 3 — Who experiences the impacts and to what degree (if at all) depends on who is performing the cooking-related activities, and this is often determined by gender and age. Although most (but not all) improved cookstoves and fuel combinations provide some efficiency gains, it is possible for new stoves and/or fuels to not result in increased cooking capacity, increased cooking power, or less onerous tending/maintenance requirements; in fact, the opposite could be true, and time use can increase. Further, even where benefits do occur, they are not guaranteed to generate time savings because these are largely dependent on user behaviour. In some cases, cooking energy transitions result in more available fuel, which causes households to cook more than they did previously due to suppressed demand.

Stakeholders can consider the entire meal creation process, including fuel procurement and preparation, food preparation, cooking, and cleaning of pots and stove, recognizing that trade-offs in time requirements can occur among these activities. There is a distinction between “cooking time,” defined as the time during which the cook actively engages with the food while it is cooking and “stove usage,” which refers to the total time the stove is lit/operating. Both “cooking time” and “stove usage” occur within the larger framework of the meal creation process, which starts with fuel procurement and preparation and concludes with the cleaning of the pots, stove, and other utensils.

Stakeholders can consider the full range of time shifts associated with adoption of improved cooking technologies. Time and activity shifts include changes in time patterns within the cooking activity as well as changes in the use of non-cooking time associated with adoption of improved cooking technologies, including the use of any time savings.

EXAMPLE 2 — A family could move from a technology that is slow-cooking but has low fuel-tending requirements, to one that cooks quickly but needs more frequent tending. In this case, the cook could no longer be able to multitask after the stove is lit, and could need to chop vegetables ahead of time, so the shorter cooking time is offset by the need to prepare food before lighting the stoves.

343 NOTE 4 ~~Time and activity shifts could be experienced by one or more household members simultaneously,~~
 344 ~~either separately or in an interdependent manner. For example, gains in cookstove efficiency could result in~~
 345 ~~shorter fuel collection times for one family member and shorter cooking time for another. How time shifts~~
 346 ~~from one household member to another is often determined by gender dynamics within the household.~~

347 NOTE 5 ~~Use of time savings could include engagement in productive activities, child-care, leisure, and~~
 348 ~~sleep. The time savings could be used for more or less pleasant/drudgerous non-cooking activities; for~~
 349 ~~example, less cooking time resulting in more labour-intensive agricultural responsibilities.~~

350 Stakeholders can consider that cultural perceptions of time are not uniform; time-savings are not
 351 universally valued or even viewed as an asset in some settings. Furthermore, the valuation of time
 352 saving often varies according to gender dynamics, with women and girls' time often less valued.

353 NOTE 6 ~~Regardless of whether actual time savings are achieved, household members could perceive time-~~
 354 ~~related benefits from cooking system changes.~~

355 EXAMPLE 3 ~~Changes in stove tending requirements could allow multi-tasking, which creates a perceptio~~
 356 ~~of time efficiency/savings.~~

357 NOTE 7 ~~Cooking and fuel collection activities are not a universally negative experience for those wh~~
 358 ~~perform them.~~

359 EXAMPLE 4 ~~Preparing family meals could be personally satisfying to the cook, just as collecting fuel coul~~
 360 ~~be an opportunity for groups to socialize.~~

361 4.3.3 Well-being

362 Stakeholders can consider how well-being is impacted by (1) access to improved cooking energy
 363 system, and (2) involvement in the cooking energy value chain. Well-being is a combination of
 364 objective factors (quality of life and material conditions) and subjective factors (positive emotions
 365 and moods, the absence of negative emotions, satisfaction with life, fulfilment, and general positive
 366 functioning)^[14]~~[14]~~. (See ~~Table 5~~~~Table 5~~ for tools for measuring well-being.)

367 NOTE 1 ~~Stakeholders can consider consumers' perception of benefits of improved cooking. Perceived~~
 368 ~~benefits can differ amongst women and men in the household, regardless of who is using the stove on a regular~~
 369 ~~basis. Perceived benefits can include reduced cooking time, reduced fuel expenditures, a cleaner kitchen, and~~
 370 ~~pride in ownership of new products (or having status from being part of the value chain for an aspirational~~
 371 ~~product). A change in the taste of food could be a perceived drawback.~~

372 NOTE 2 ~~Stakeholders can consider cookstove users' perception of changes in drudgery because of~~
 373 ~~cookstove use, recognizing that improved cookstoves can decrease or increase perceived drudgery.~~
 374 ~~Individuals could find they can reduce the length and frequency of fuel collection trips. Alternatively, users~~
 375 ~~could perceive an increase in drudgery associated with fuel processing, such as the need to chop wood into~~
 376 ~~smaller pieces to fit their improved cookstove, or the need to feed their improved cookstove more frequently.~~

377 4.4 Health impacts

378 4.4.1 Accidents and safety

379 Stakeholders can consider the health impacts of cooking energy system use with respect to accidents
 380 and safety. This subclause outlines key health risk factors and assessment recommendations
 381 associated with traditional cooking methods and fuels beyond those attributed to exposure to
 382 household air pollution (discussed in ~~5.2.5.2~~). Further guidance on conducting safety assessments
 383 on cooking technologies and fuels in the field can be found in ISO 19869:2019.

384 4.4.1.1 Burns

385 Stakeholders can consider the risk of cooking-related burn injuries. Household use of traditional
 386 cookstoves is associated with several environmental and health problems, including a significant