

focusing on cybersecurity and ethical issues related to autonomous vehicles. These sub-categories are integrated into a comprehensive list of 46 impact subcategories, with 35 from UNEP/SETAC Guidelines.

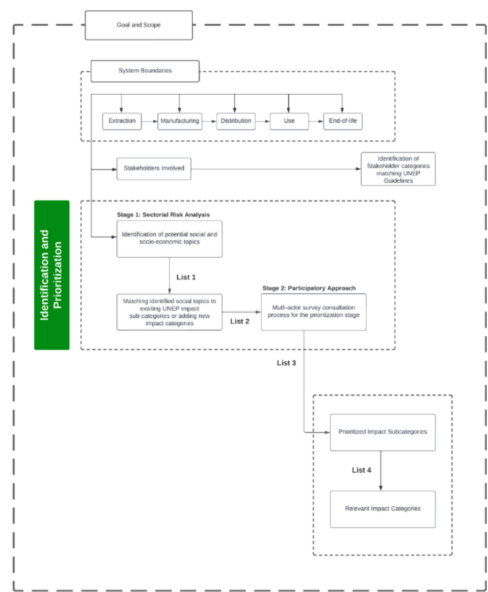


Fig. 1. Methodological Framework Design of the Study

The impact sub-categories are then prioritized based on the prioritization criteria of the study. These were matched with UNEP's impact categories, including Human Rights, Health and Safety, Working Conditions, Governance, Cultural Heritage, and Socio-economic repercussions. Specific definitions and interrelationships were examined from various sources.

The research aimed to identify key social impact categories related to autonomous electric car-sharing fleets, advancing Social Life Cycle Assessment (S-LCA) standardization. Its core mission was to communicate and raise awareness impartially among diverse stakeholders about potential social consequences tied to innovative shared mobility systems, all in pursuit of mobility sector sustainability. The study carefully connected the research question, initial objectives, and results, yielding insights for various stakeholder categories in advancing sustainability. The examination of five key stakeholder categories - "Local Communities," "Society," "Users," "Value Chain Actors," and "Workers" - unveiled significant social impact subcategories intertwined with sustainability. For local communities, air quality, secure living conditions, public space, and noise pollution emerged as vital for city and community sustainable development, emphasizing collective stakeholder efforts. Society showed diverse perspectives on social impacts, with unanimous acknowledgment of urban development and economic contributions but concern about corruption, highlighting ethical practices' role in equitable development.

Users of autonomous electric car-sharing emphasized accessibility, health, safety, affordability, and infrastructure interoperability. Disparities between user and societal perspectives underlined the need for user-centric policies for sustainable and inclusive mobility. Value chain actors highlighted "Fair Competition" and "Wealth Distribution," emphasizing equitable practices and responsible supply chain conduct. The study focused on workers, identifying concerns like health, safety, child labor, forced labor, and fair wages, crucial for sustainability, particularly in raw materials extraction for lithium-ion batteries. Many prioritized impact subcategories fell under "Human Rights," emphasizing its role in autonomous car-sharing sustainability across stakeholders. Despite challenges, including limited end-of-life phase data and the need for enhanced UNEP guidelines, the study proposed valuable recommendations. These included considering the 11 newly identified impact subcategories for sector-based UNEP Guidelines for Social Life Cycle Assessment within the mobility sector. To enhance future research, increasing survey sample sizes and targeting participant profiles' quality were suggested. Expanding system boundaries for assessments, especially at the end-of-life phase, was recommended for holistic social implications evaluation.

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Author Index

A

- Aakko-Saksa, Päivi 153
Acciaro, Michele 127
Acevedo, Andreia Lopes 415
Adams, Peter 859
Adl-Zarrabi, Bijan 802
Ajaykumar, Siddharth 629
Ali, Marwa Ben Taleb 24
Allen, Martin 427
Almeida, Arminda 652
Almeida, Carina 382
Alonso, Gustavo 368
Al-Tabbaa, Abir 747
Álvarez-Lorenzo, Rodrigo 368
Amaral, António 267
Anastasio, Sara 754
Anderluh, Alexandra 361
Anderson, Alan 868
Andreolli, Raphael 375
Andrieu, Vera-Marie 304
Antunes, Vítor 382
Antunes, Vítor 816
Appolloni, Letizia 166
Arandia, Iker 446
Arce, Rosa 160
Arellano, Diana 659
Argerich-Martín, Clara 368
Arregui, Harbil 446
Arrigoni, Vincent 24
Arsenio, Elisabete 93, 609
Astegiano, Paola 569
Aumond, Pierre 58
Ayfantopoulou, Georgia 354, 494, 529, 550, 569

B

- Bailey, Helen 809
Baker, Gerry 196
Bañobre, Raquel Ledo 796

- Bañuelos-Gimeno, Jorge 160
Barateiro, José 609
Barbu, Corneliu 659
Barfod, Michael Bruhn 304
Barreira, Luis 153
Barroso, Suely 733
Barry, Stephen 427
Basso, Matteo 726
Batsalia, Nikoletta 65
Becker, Christoph 543
Beil, Denise 246
Below, Michael 107
Benini, Alice 603
Benito, Arturo 368
Berger, Martin 361
Berthet, Kevin 831
Beye, Charly 141
Bielaczyc, Piotr 153
Boos, Adrian 141
Borge, Rafael 45
Boullet, Thomas 10
Bowes, John 427
Brandner, Manuela 395, 636
Brandstätter, Georg 487
Brennan, Alfie 761
Brennan, Dan 38
Brero, Giovanni 802
Brownrigg-Gleeson, Mari Luz 415
Brun, G. 3
Brun, Ghislain 10
Buchegger, Julia 563
Buijs, Paul 623
Bulckaen, Léo 100
Burghardt, Tomasz E. 17
Burguera, Fernando 796

C

- Cabral, Antônio Eduardo 733
Caetano, Fernanda 768

Calado, E. A. 703
 Camacho, J. 219
 Campbell, Rose 523
 Camps, Francisca Rosell 460
 Can, Arnaud 58
 Capitão, Arminda Almeida 645
 Capitão, Luís Picado-Santos 645
 Capitão, Silvino 645, 652
 Carballal, Miguel Moldes 726
 Carrilho, H. 3
 Carrilho, Heidi 10
 Carriquiry, Juan Pedro 304
 Carroll, Paula 388
 Cartolano, Fabio 324
 Carvalho, Manuela 768
 Cejudo, Iñaki 446
 Cerdeira, M. 719
 Cerqueira, Sofia 609
 Cervena, Tereza 153
 Chiello, Olivier 58
 Ciprés, David 695
 Claudio, Ferrari 226
 Clausen, Uwe 782
 Colpier, Ulrika 339
 Connolly, Lorcan 809
 Conter, Marco 802
 Coppinger, John 868
 Corazza, Maria Vittoria 31, 166
 Cornet, Yannick 172
 Correia, Eugénia 768
 Cossu, Paola 324, 569
 Costa, Francesco Paolo Nanni 603
 Crewe, Clive 616
 Crowley, Willie 196
 Crushell, Patrick 196
 Cummins, Stephen 427

D

D'Alessandro, Daniela 166
 da Costa, Eduarda Marques 93
 da Silva, Manuel Carlos Gameiro 71
 Dais, Sofoklis 550
 Davies, Ian 38
 De Bortoli Vizioli, A. 219
 de la Guerra, E. 719
 de Macedo, António Lemonde 93
 de Melo Akel Thomaz, Diego Bandeira 523

Deakin, David 38
 Delater, A. 3
 Delhay, David 153
 Dellbrügge, Marius 782
 Delmeire, Nik 240
 Demetrio, Andrea 543
 Derguech, W. 219
 Devasia, Dixon 629
 Di Mascio, Paola 31
 Dittrich, Michael 65
 Djordjevic, Boban 460
 Domingues, Daniela 768
 Dopler, Silvia 246
 Dossou, Paul-Eric 253
 Drysdale, J. 219
 Duarte, Sérgio Pedro 439
 Dubey, Mayank 259
 Duggan, Alan 196
 Duhme, Wiebke 240
 Duin, Heiko 285, 474
 Duldner-Borca, Bianca 246
 Dutta, Nilankur 100

E

Edwin, van Hassel 226
 Egger, Martin 298
 Einsele, Florian 453
 Ekblad, Alf 78
 El Baghdadi, Mohamed 852
 Elgner, Felix 543
 Ellingsen, Linda Ager-Wick 680
 Elmarakbi, Ahmed 726
 Eschment, Lukas 285, 292, 467, 474
 Escuin, David 695
 Esneu, X. 219
 Evans, Mike 859, 876

F

Fable, S. 3
 Falkgrim, Eric 375
 Favero, Jérôme 796
 Félix, Rosa 85
 Fergadiotou, Ioanna 536, 569
 Ferreira, Victor 659
 Fetka, Jonathan 361
 Flynn, Damian 388
 Fonseca, João Clérigo 816

Fontes, Tânia 267
 Fors, Vaike 515
 Fournier, Guy 141
 Fox, Eimear 192, 823
 Franchina, Federico 212
 Franklin, Rod 569
 Franzoni, Lorenzo 78, 107
 Freire, Ana Cristina 816
 Friedman, Miles 831
 Funke, Simon 453

G

Gallagher, Ann-Marie 876
 Ganeau, Luois 153
 Gao, Bo 616
 Garcia-Sanchez, David 809
 García Rubio, David 324
 Garland, J. 219
 Gaspar, Pedro 382
 Georgakis, Panos 536
 Ghoniem, Engy 726
 Ghozzi, Fayes 10
 Giannoudis, Vasileios 529
 Gibney, Amanda 789
 Gournet, Nicolas 10
 Graindorge, Tatiana 523
 Grau, Josep-Maria Salanova 354
 Gulino, Michelangelo Santo 433
 Gustafsson, Magnus 480

H

Hall, Gerard 427
 Haller, Andreas 453
 Halpenny, Alice 876
 Hameister, Hannes 543
 Harrington, Lauren 38
 Hartavi, A. E. 703
 Hartmann, Andreas 710
 Hasenleithner, Tobias 298
 Haubold, Holger 178
 Hausberger, Stefan 852
 Healy, B. 219
 Heaphy, Rachel 196
 Hegazy, Omar 852
 Hellström, Magnus 480
 Helo, Petri 501
 Henriques, Rui 609

Herrmann, Christoph 782
 Hettich, Greta 311
 Hewitt, Alison 802
 Himmelbauer, Gabriel Stephan 298
 Hinkka, Ville 318
 Hoeborn, Gerrit 556
 Hogan, D. 219
 Hong, Jinhyun 120
 Honkisz, Wojciech 153
 Hook, Hannah 172
 Houssou, U. 219
 Hu, Bin 395, 563, 636

I

Ignatavicius, Simonas 868
 Illek, Günther 361
 Ingratoci, Cinzia 212
 Irigoyen, Eider 446
 Irudayaraj, Jow 253
 Irving, Hugh 761

J

Jäger, Victoria 453
 Jakiel, Christoph 292
 Jaksic, Vesna 761
 Järvinen, Anssi 153
 Jenelius, Erik 375
 Jezdinsky, Tomas 659
 Jiménez-Redondo, Noemi 845
 Jose, Davis 885
 Josefsson, Andreas 339
 Jović, Marija 240
 Juraschek, Max 782

K

Kääriäinen, Jukka 318
 Kallionpää, Erika 589
 Kampa, Maria 536
 Kangley, Virginia 427
 Käsäkoski, Janne 409
 Karakikes, Ioannis 515
 Karjalainen, Panu 153
 Karlström, Magnus 339
 Kavanagh, Alan 868
 Kehrt, Carina 311
 Kiefer, Maximilian 782
 Kiouisi, Akrivi 536

Kissane, Paul 196
 Klein, Eric 583
 Kolarova, Viktoriya 421
 Kompp, Ricarda 246
 Kontses, D. 703
 Kontses, Dimitrios 51
 Koukounaris, Athanasios I. 134
 Krauss, Konstantin 114
 Kublin, Thomasz 474
 Kural, Karel 629
 Kuusniemi, Heidi 501

L

Lacroix, G. 3
 Lamb, Martin 809
 Lamme, Sascha 467
 Laschi, Maurizio 433
 Lawless, Elizabeth 427
 Le Bihan, O. 3
 Lemaitre, Guillaume 58
 Leroy, Yann 740
 Leviäkangas, Pekka 409
 Levrey, Manon 536
 Li, Jinpeng 120
 Liberko, N. 219
 Lighthart, Tom 796
 Liimatainen, Heikki 589
 Livingston, Mark 120
 Lobo, António 439
 Lodder, Taz 802
 López, José Luis 695
 Louzao, Vanesa Ventosinos 726
 Louzao, Vanessa Ventosinos 796
 Louzis, Konstantinos 509
 Lovelace, Robin 85
 Loyo, Estibaliz 446
 Lunaas, Thor Asbjørn 754
 Lund, Jesper 515
 Luppino, Giuseppe 603
 Lynch, Alan 838, 859, 868
 Lynch, Janet 876

M

Mac an tSearraigh, Cathal 831
 MacAuley, Nathan 761
 MacCriostail, C. 219
 Madden, Esther 876

Magoutas, Babis 536
 Mainardis, Olivier 859
 Majoral, Genís 596
 Maleas, Zisis 354
 Malekjafarian, Abdollah 761
 Malhene, Nicolas 523
 Malichová, Eva 172
 Mallidis, Ioannis 494
 Mamarikas-Itsios, S. 703
 Mansour Salamé, Joseph 740
 Maria Rosa Muñoz, B. 304
 Marousi, Konstantina P. 134
 Martín, Celestino Sánchez 460
 Martin, Emilie 304
 Martin, Joseph 823
 Matyusz, Zsolt 576
 McArthur, David Philip 120
 McGuinness, Matt 687
 Mejia, Alvin 304
 Mejía, Hernán 324
 Melo, Sandra 439
 Michailidis, Dimitris 789
 Mikkola, Markku 318
 Miranda, Henrique Borges 768
 Mobsby, D. 219
 Mohammed, Haneen 747
 Monzon, Andres 415
 Morganti, Eleonora 603
 Mørkrid, Odd Erik 509
 Moura, Filipe 85
 Mujika, Andoni 446
 Mulhern, Emma 318
 Mulry, Brian 868
 Munkácsy, András 576
 Muthakana, Nikhil 629

N

Nahar, Sayeda 838
 Nair, Sheba 589
 Nangah Mankaa, Rose 885
 Nassar, Ahmed I. M. 747
 Neu, Walter 285, 292, 467, 474
 Ngo, S. 3
 Ngo, Sylvie 10
 Nicolai, Isabelle 740
 Nicolas, Alexandre 100
 Nobel, Thomas 285

Nobis, Claudia 421
 Nolan, Kevin 761
 Nordahl, Håvard 509
 Notarangelo, Riccardo L. 501
 Ntemou, Amalia 536
 Ntziachristos, Leonidas 65
 Nybacka, Mikael 375
 Nyembwe, Jean-Paul Kapuya Bulaba 71

O

O'Connor, Alan 809
 O'Connor, John 831
 O'Dea, Gerard 859
 O'Malley, Vincent 38, 192
 O'Reilly, Ciarán J. 375
 O'Shea, Patrick 196
 Oertli, Jakob 78
 Ogundiran, John Omomoluwa 71
 Oliveira Mesquita, Amanda 576
 Ornek, Mustafa Arslan 205
 Ortega, Ismael 153
 Oudin, Anna 153
 Ozturk, Cemalettin 205

P

Pagels, Joakim 153
 Pakrashi, Vikram 761
 Panagakos, George 304
 Papageorgiou-Koutoulas, Alexandros 51
 Pardhi, Shantanu 852
 Pashkevich, Anton 17
 Patterson, Fiona 196
 Pawlak, Thibault 24
 Pekkala, Veikko 409
 Pérez, M. 719
 Perry, Kimberley 876
 Pfoser, Sarah 395, 636
 Philipps-Bertin, Chrystèle 58
 Picado-Santos, Luís 652, 733
 Pierce, David E. 775
 Pinto, Tassia Carolina Forasteiro 523
 Platzter, Mario 361
 Podimatas, Vassilis 509
 Polo, Lorena 695
 Polydoropoulou, Amalia 515

Ponweiser, Wolfgang 395, 636
 Popov, Ilya 796
 Portoghese, L. 219
 Prandstetter, Matthias 274, 395, 636
 Putz-Egger, Lisa-Maria 246
 Pyykkö, Harri 318

Q

Quaassdorff, Christina 45
 Queron, J. 3

R

Rabadan, Laura 446
 Radziszewski, Paweł 474
 Rahim, Ashik 885
 Rahnama, Shaghayegh 695
 Ramdas, Vijay 809
 Rapinc, Philippe 324
 Rato, Maria João 768
 Realpe, Grace Carolina López 304
 Reeh, Lucas 361
 Reichmann, Matthias 298
 Reimann, Maximilian 361
 Reinthaler, Martin 395, 636
 Rengaraju, Sripriya 747
 Ribeiro, Anabela Salgueiro Narciso 71
 Rissanen, Matti 153
 Riverso, S. 219
 Rizopoulos, Dimitrios 536
 Rodrigues, Marta 93
 Roldin, Pontus 153
 Rönkkö, Topi 153
 Rosengren, Lars-Göran 339
 Rothbard, Sandra 324
 Rounak, Aasifa 761
 Roux, Maël 58
 Roy, Stabak 402
 Ruane, Kieran 761
 Rudolf, Sina 782

S

Sahivirta, Hanna 659
 Saïdani, Michael 740
 Salminen, Simo 318
 Samaras, Z. 703

Samaras, Zissis 51
 Santos, Joao 710
 Saripada, Naressa 304
 Saurí, Sergi 596
 Schmidt, Franziska 583
 Schrevere, Thomas 24
 Schroer, Tobias 556
 Schuh, Thomas 107
 Schüning, Thomas 285, 292, 467, 474
 Schwartz, Henry 480
 Schwingshackl, Michael 852
 Seeßle, Patrick 453
 Seidel, Saskia 311
 Selz, Emanuel 361
 Serna-Guerrero, Rodrigo 659
 She, Cliodhna Ni 388
 Sheils, Emma 809
 Shrestha, Shritu 304
 Sieber, Niklas 114
 Silva, André Teixeira 439
 Silva, Vasco 267
 Silva, Weber 733
 Simons, Janis 556
 Singh, Avishreshth 809
 Smith, Andrew S. J. 775
 Smyth, Stephen 859
 Snijlsberg, Brynhild 754
 Sobrino, Natalia 160
 Sochor, Jana 332
 Sofronov, Yavor 659
 Solís-Hernández, José 845
 Specht, Patrick 240
 Sprei, Frances 332
 Stadlmann, Burkhard 298
 Stamelou, Afroditi 494
 Stamm, Marcel 292
 Starkl, Fritz 274
 Stefanutti, Ronaldo 733
 Stein, Sandra 274, 556
 Stephanedes, Yorgos J. 134
 Stipanovic, Irina 710
 Stouraiti, Angeliki 509
 Strong, Neil 107, 185
 Sund, Even K. 754

T

Tabakovic, Amir 838
 Tacoglu, Melis Tan 205
 Talreja, Harshit 259
 Taurino, D. 219

Tavajoh, Simin 802
 Tebby, C. 3
 Telford, Alexandra 747
 Thierry, Vanelslander 226
 Thorne, Rebecca Jayne 680
 Timonen, Hilkka 153
 Todorov, Georgi 659
 Toivanen, Leena 409
 Toner, Declan 868
 Topinka, Jan 153
 Toribio-Díaz, Concepción 845
 Traverso, Marzia 885
 Triantafyllopoulos, Georgios 65
 Tsirimpa, Athena 536
 Tsvetkova, Anastasia 480
 Turkan, U. U. 703
 Tziovas, Athanasios 65

U

Úbeda, Aristarco Tomás 460
 Urbano Escobar, Raúl 324
 Urquhart, Duncan 38
 Uzu, G. 3

V

van den Boom, Nicole 141
 van Vliet, Dave 838
 Vangi, Dario 433
 Vargas-Farias, Andrea 710
 Varveri, Aikaterini 809
 Ventikos, Nikolaos P. 509
 Vieira, Carina 768
 Viner, Helen 809
 Vojtisek-Lomgand, Michal 153
 Vokes, Warren 196
 von Stamm, John 556
 Voulkopoulos, Vasileios 529

W

Wadhwani, K. 219
 Wagner, Adrian 298
 Walker, Alan 616
 Wallbaum, Holger 802
 Wancura, Herbert 298
 Warzok, Dominic 543
 Weldon, David 823
 Wendel, Jochen 543
 West, Kevin 868
 Widhalm, Peter 274, 563

Wilson, Benjamin P. [659](#)
Winterlich, Edward [868](#)
Wolf, Martijn [78](#)
Wolfram, Daniel [453](#)
Woodburn, Joseph [153](#)
Wouter, Schmidt [226](#)
Wurst, Stephan [285](#), [474](#)

X

Xenou, Elpida [529](#)

Y

Yatskiv, Irina [474](#)
Yilmazer, Pinar [107](#)
Yilmazer, Pinar [78](#)

Z

Zaiko, Nikita [339](#)
Zajicek, Jürgen [298](#), [487](#)
Zeybek, Hulya [402](#)
Zlatev, Blagovest [659](#)