Global HR's Green Opportunity:

Using Global Mobility to Drive Environmental Change

WHITE PAPER 2.0

Contents

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Version 2.0 December 16th 2024 - Read previous paper here: www.ExpatRide.com/WP

About ExpatRide

ExpatRide was inspired by our CEO & founder Jesper Løvendahl's challenges in leasing a car without a U.S. credit history when he moved to New York in 2005. Since ExpatRide was founded in 2011, we have focused 100% on the needs of the Global Mobility industry. Solving car services challenges worldwide across 176 countries.

Headquartered in Miami, we have regional offices in Copenhagen, Manila, and Prague.

Our mission: We are dedicated to delivering tailored, eco-friendly mobility solutions that meet our clients' unique needs. We provide seamless and efficient global transportation services, ensuring the highest level of customer satisfaction. By leveraging our extensive network of supplier partners, we create customized solutions that align with client goals and ESG best practices.

As a trusted partner in the global mobility industry, we are committed to helping our clients succeed while promoting sustainability through responsible practices.

Servicing Fortune 500: For over a decade, we have served executives with many Fortune 500 companies. Our services have spanned a broad spectrum, from daily chauffeur services in China to armored vehicle options in Mexico and luxury car rentals in Los Angeles. Each experience is customized to meet the unique needs of the client.

Sustainability: For the past four years, we have increased and focused our resources on mitigating the environmental impact of our services and empowering our clients and partners to reach their sustainability goals.

Certifications:

ISO 9001 : showcasing our commitment to high-quality service and consistent customer satisfaction.

ISO 14001 : emphasizes our commitment to sustainability, ensuring we contribute positively to the environment as we grow.

ISO 27001 : Ensures the safety and security of our clients' data, which is a top priority as we continue to grow digitally.

Sustainability Manager Foreword

In recent years, the urgency surrounding climate change and global warming has intensified, driving governments to implement stricter environmental regulations and corporations to revisit their policies and the sustainability of their operations. Sustainability has become a regular topic in most industries, and just by looking at RFP questions, conference sessions, or LinkedIn posts, it is clear - that the global mobility industry is fully engaged in this conversation, too. Despite this reality **presenting a huge challenge for Global Mobility HR, RMCs, and DSPs**, an increased focus on sustainability within global mobility is the forward. So the question is: **How to make relocation greener?**

There is no easy answer; yes, it won't be easy. However, neglecting this challenge would mean shrugging off our responsibilities and missing out on a huge opportunity. To explore this opportunity and better understand Global Mobility's impact on the global environmental landscape, we embarked on the journey to write our first White Paper, Driving Sustainability: The Case for Eco-Conscious Assignments in Global Mobility, earlier this year. Yet, as we wrapped up that project, one thing became apparent: we had only scratched the surface. So we began to look at relocation in a new light: **not just as a logistical process but as a moment of transformation for employees** and organizations alike. Because improving the environment depends on changing policies as much as it does on changing people, that is also why we teamed up with a renowned professor of psychology of change, Prof. Bas Verplanken, and dedicated a considerable part of this document to examining **how major life events, like relocation, create windows for impactful behavioral shifts**. This perspective enriched our understanding of sustainability in global mobility and emphasized the importance of designing relocation programs that empower employees while achieving measurable environmental outcomes.

It became clear that **Global HR plays a vital role in shaping the future of sustainable mobility**. As stewards of talent, HR leaders have the ability to influence relocation policies, set the tone for environmental accountability, and create the structures employees need to embrace sustainable behaviors. The Global Mobility support network orchestrated by the **RMCs has the competencies and leverage to help accelerate these changes.** That being said, there is an immense opportunity in the event of relocation, which can help reduce its carbon footprint. But we have to start looking at long-term international assignments more holistically, expanding our thinking beyond the logistics of moving and accepting the wide range of other factors throughout an entire assignment that add up to its overall environmental impact.

This paper aims to outline the conditions under which **relocation could mean a positive change for the environment** and help you to navigate towards a more proactive approach to contributing to this positive change. I hope reading it inspires you to embrace this opportunity we have in Global Mobility and will help you think differently.

Enjoy the reading,
Green regards

Pavla Skorpilova
Sustainability Manager, ExpatRide

Global HR's Green Opportunity

One might argue that moving and relocating assignees is not good for the environment in a transportation-heavy sector such as the Global Mobility industry. In this paper, we provide a counterargument to that point of view and provide you with more data and perspectives, all pointing to the possibility that relocating talent can have a positive environmental impact in a way that would not be possible were a given employee not to make a work-related move. When Global Mobility policies align with ESG goals, assignees are provided with education and support, and holistic relocation support is provided, we have real opportunities to make a positive impact.

ExpatRide is committed to encouraging this transformation and inspiring Global HR teams to embrace its potential to improve their companies' carbon footprint. Through our collaboration with Professor of Psychology Bas Verplanken, we examined the unique position of the Global Mobility industry, the relevant studies, and their relation to Global Mobility specifics. International assignments represent a significant transition in an individual's life, not only from a perspective of physical movement and professional changes but also from an emotional, social, and cultural perspective. Driven by the opportunity for career advancement and life experience, employees are leaping forward into the unknown when they accept an international assignment. They may need to realize that their move is also a unique opportunity to do better for our planet.

International Relocation as a Major Life Event

Major life events can be a powerful catalyst for change, significantly influencing an individual's behavior and mindset. Some life events, for example, marriage, having children, and moving house, come planned and desired. Injuries, illness, and natural disasters arrive unexpectedly and are undoubtedly unwanted. Such major life events can often disrupt established routines, prompting us to reflect on the circumstances, consider new options in our lives, and change accordingly. For example, a heart attack may prompt the sufferer to establish a healthy diet and take up exercise, or a move might offer someone a chance to change their social life and find new types of friends.

> We asked Professor Bas Verplanken; "Seen as a major life event, does a move have the potential to trigger new behavior and more sustainable habit creation?" the answer to that question is a definitive, "Yes!"

By default, a corporate relocation offers a natural opportunity to disrupt habits and routines, which is why Global HR is uniquely positioned to reinforce and direct such sustainable change. As mentioned, global HR can significantly impact companies' ability to reach their ESG goals and improve the environment.

In cooperation with Professor Bas Verplanken - ref. 1,2,3.

The Habit Discontinuity Study by Prof. Verplanken

While writing our previous White Paper, Driving Sustainability: "The Case for Eco-Conscious Assignments in Global Mobility," we came across an academic study by Professor Bas Verplanken related to change and habit discontinuity. We recognized immediately that his work suggested valuable grounds for exploring the impact relocating has on people's choices and habits. We wanted to understand how this can be leveraged for the benefit of the Global Mobility HR and our efforts to make moving greener. That is why we approached the Professor and agreed to cooperate. We asked him to take a close look at our industry and, leaning on his extensive experience and research, provide us with his perspective on Global Mobility as a window for potential habit change and what that may mean for sustainability.

Our behaviors are often driven by deeply ingrained habits, influenced by attitudes and motivations. This automaticity is the product of the frequent repetition and consistency of the behavior under the same circumstances. This is what makes a habit. Take a commute to work as an example. Typically, a person does not make a conscious decision about how to travel to work. Instead, when the right timing occurs, the person automatically gets in the car to head to work. Only in case there is some disruption in the form of temporary roadblocks, the car being in the repair shop, etc., is the person forced to consider an alternative option.

New habit formation reinforcement

These reinforcements can have many forms, from monetary, convenience, or even pleasure.

> "Habits exist because they serve us in some way. An important aspect of habits is that they require some form of reinforcement. This applies during the formation of habits particularly."
>
> - Professor Bas Verplanken

Sometimes, the fact that our actions can be seen as contributing to a good cause can reinforce that behavior. Reinforcements are a valuable tool that can help companies with their interventions, however as the Professor highlights:

> "...most interventions are aimed at behavior change focus on providing information that targets people's attitudes, aiming to change their expectations of the risks or benefits of a particular choice. However, once habits are developed, attitudes are no longer the primary drivers of behavior. Instead, behavior is triggered by cues in the behavioral context. Thus, information-based interventions are often ineffective."
>
> - Profesor Bas Verplanken

In other words, habit change is more frequently the result of changing the context in which we live and operate rather than changing our attitudes. So, when it comes to nudging employees to make greener choices, rather than dedicating too much effort to change people's attitudes, we would be better served by focusing on the context and how altering the environmental cues triggers and supports the desired behavior.

Bas Verplanken
Professor of Social Psychology
University of Bath

In cooperation with Professor Bas Verplanken - ref. 1,2,3.

The Habit Discontinuity Study

The study

During the relocation, the assignees' living environment and circumstances undergo a dramatic change. Nearly every aspect of their day-to-day lives, from where they get their hair cut to who they socialize with to how they take out their trash, is altered in some way. An opportunity window for the establishment of new habits emerges. This "phenomenon" was studied in a controlled study of 800 households in the UK. Professor Verplanken and his team tested circumstances and interventions that would promote sustainable behaviors in the context of a household relocation as a significant change. Participants were divided into two groups: 400 households that relocated recently and 400 households that did not.

800 households in Peterborough, UK

400 Relocated recently

400 Did not relocate

Participants were asked how often they had performed 25 sustainable behaviors related to water consumption, waste management, transport, and energy usage during the last year. These were presented again eight weeks later with reference to the same time frame. His study brought interesting conclusions that can serve as important insights for Global Mobility.

Sustainable Behaviors

Water
- Shorter showers
- Using dual flush etc.

Transport
- Walking, cycling short journeys
- Ecologically friendly driving etc.

Waste
- Using reusable shopping bags
- Using leftover food etc.

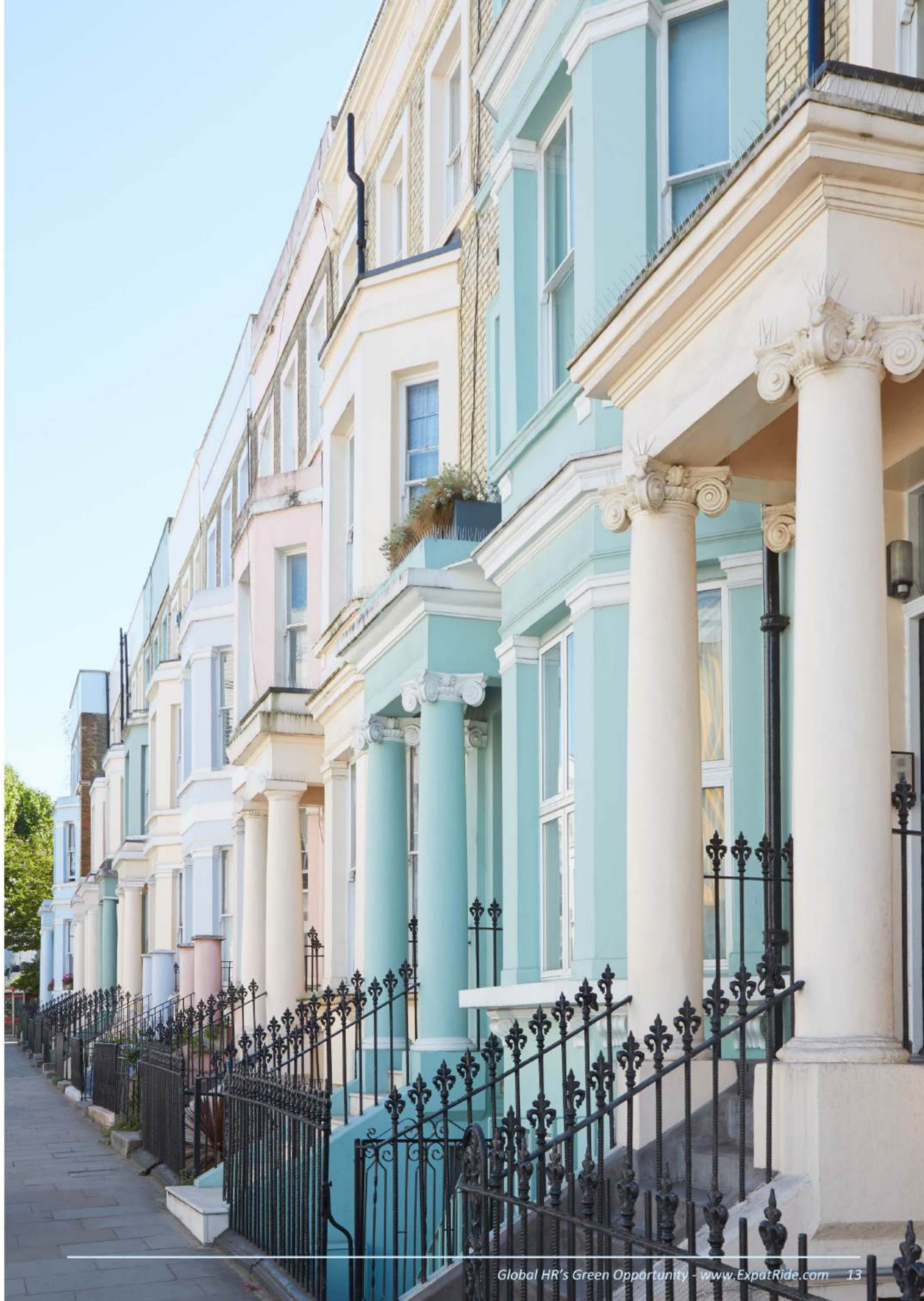
Energy
- Turning down the heating
- Washing clothes at lower temperatures etc.

The interventions for taking more sustainable actions were more effective in the households that had moved recently. The effect was even more noticeable in the households that moved within the past three months.

These findings suggest a critical window during which a discontinuity, such as moving house, provides an enhanced opportunity for behavior change. In this window, the changed circumstances force people to "pause and think" and reevaluate the options and choices they make. Moreover, people going through the process of change are more open to considering alternatives that they had not considered before. Professor Verplanken also suggests that these moments can activate important values, such as pro-environmental ones.

By understanding these mechanisms, companies can design and amend their policies and interventions more effectively and better time them, thus helping the assignees make more sustainable choices without adding additional burdens to the whole process.

In cooperation with Professor Bas Verplanken - ref. 1,2,3.



The Habit Discontinuity Study

Academic Study vs The Real-Life Scenario

The outcome of this academic study presents a solid base for understanding the psychology of change and the impact the right interventions can have on an individual's behavior and habits. Having read Professor Verplanken's work, we were curious to know what would happen if we were to apply the same principles in a commercial environment. Could his results be duplicated in the real world, and if so, what would the resulting environmental impact be? We believe that leveraging a move to encourage employees to adopt sustainable habits can have an even more significant effect than that discovered in the Professor's research.

The Readiness of Global HR to Make an Impact

For Global Mobility professionals, this period represents a unique opportunity. The nature of relocation places you in a strategic position to influence sustainable behaviors more deeply than at nearly any other time in an employee's journey. By proactively shaping these choices and offering impactful options, you wield significant influence over assignees' long-term habits. Your readiness and commitment to weave sustainability into their new life supports company ESG goals and brings lasting environmental benefits. This is a rare moment where your direct involvement can foster sustainable habits that employees carry forward, impacting their work and personal lives. So why do we think Global HR has a more substantial advantage when turning this opportunity into a real impact compared to an academic study?

01

First, the study was conducted with respondents approached by an NGO. By contrast, during a company relocation, the relationship with the individual = assignee is already established, which puts the company in a better position to begin an intervention. Furthermore, the intervention can be started much earlier, enabling the corporation to initiate discussions on sustainability as soon as relocation plans are made.

02

During the study, the participants were provided with a support package that included information tailored to the specific interests of the individual and a goodie bag with sustainability-related items. The level of support that a corporate employer, an RMC, and the entire family of service providers can provide during the relocation can be much more impactful, personalized, and complex.

03

The general influence and control over an employee as an employer and a policy maker is much less limited than in the study's case. Employers have much greater leverage. The influence might be more significant as the company acts on its pro-environmental values and offers opportunities for assignees to act accordingly, especially those who value sustainability.

In cooperation with Professor Bas Verplanken - ref. 1,2,3.

The Aspects of a Successful Intervention

Considering Professor Verplanken's research and understanding the psychology of habit change helps us understand the mechanism of "why." The next question many HR in our industry may ask at this point in the paper is, "How?" How can we do our jobs to see that the relocation is successful while we intervene to encourage the assignee's successful adoption of more sustainable habits? The truth is that there is no single solution. Just as moving is a complex and variable process, encouraging employees to use the move to shift to a green lifestyle will require flexibility, creativity, and change on the part of Global Mobility.

Assignee Segmentation

As every individual assignee is unique, their motivations and values naturally differ. Unfortunately, it is not feasible to develop customized policies for every single assignee based on their personalized and unique preferences. That is why segmenting the assignees according to specific criteria might be helpful. With this challenge in mind, Professor Verplanken proposed using the framework of Sustainable behavior change, which appears below. This model works with two segmentation criteria: first, the motivation to adopt sustainable behaviors, and second, having an opportunity to do so. The higher the motivation to act sustainably and the higher the opportunity, the more likely it will result in sustainable behavior. When both are present, as in the situation of an environmentally motivated employee who is relocating, the conditions for change are ideal. However, where motivation is lacking, it can leverage the opportunity for change presented by the relocation as a vehicle for helping employees establish a green lifestyle.

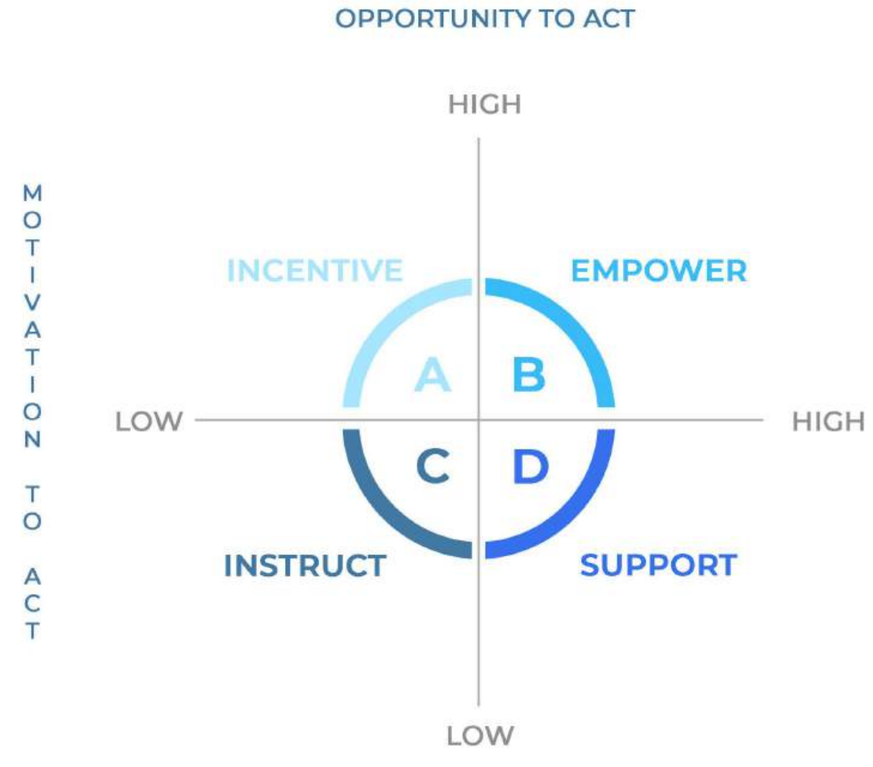


Diagram: A segmentation model of sustainable behavior change interventions - Ref 2
In cooperation with Professor Bas Verplanken - ref. 1,2,3.

> It can be possible to leverage the opportunity for change presented by the relocation as a vehicle for helping employees establish a green lifestyle.
>
> -Professor Bas Verplanken

In this model, motivation is seen as an internal criterion depending highly on values and attitudes; however, the opportunities are rather external barriers or enablers such as availability, resources, infrastructure, etc.

Diagram legend:

- *"**Segment A**: Focuses on emphasizing the financial benefits of adopting sustainable practices. This could include savings on gas, electricity, or discounts on rental cars. Sharing the company's achievements in sustainable savings with employees as rewards can also be effective."*
- *"**Segment C:** May involve mandatory measures and is suited to corporate cultures with a strongly hierarchical structure and supporting bureaucracy."*
- *"**Segment D**: Addresses the need for support where it is lacking. This approach does not require convincing employees of the need for sustainability but rather offers support through subsidies for sustainable choices or providing information on how to lead more sustainable lifestyles."*

As you can understand from the diagram, the individuals in **segment B** are presumed to have the best position to adopt and keep sustainable habits. Not only thanks to their high intrinsic motivation and their most likely pro-environmental values but also thanks to opportunities provided by the employer. For the individuals from the remaining segments, strong habit architecture has to be in place to help them sustain the new habits and stimulate their actions and motivation.

Thus, the goal is to create a policy that supports and motivates the widest spectrum of individuals, combining mandatory policies with empowering commitment, feedback, community, and rewards. Individuals who are already environmentally conscious will be even more empowered. Individuals not already practicing sustainable habits will be supported and encouraged to consider all the benefits of the new choices they might adopt.
When it comes to encouraging employees to establish sustainable habits a combination of mandating sustainable choices within the relocation package and encouraging them wherever mandates are not possible offers real opportunities for a positive impact on the environment via a means that has not yet been considered in the world of global mobility. The possibilities are tremendous, with potential benefits for all involved, from the corporations to the employees. The real winner, though, is the planet.

In cooperation with Professor Bas Verplanken - ref. 1,2,3.

The aspects of a successful intervention

As the approach to global mobility evolves, it becomes increasingly important to understand how the timing and structure of interventions can influence long-term sustainability outcomes. Companies can help drive meaningful behavior changes by strategically implementing support systems and offering employees guided choices early in their relocation process. As Prof. Verplanken's study highlights, timing and support are the key elements contributing to success in promoting sustainability during employee relocations. That should also be reflected when creating the sustainable mobility strategy.

Timing of intervention

Professor Verplanken's study concluded that there is a time-limited "opportunity window of three months" after relocation when the right interventions have the highest potential. This time defines a frame when the daily routines are established and key decisions are made. With time, the opportunity window closes. The opening of the window can happen even before the physical relocation itself, namely, as soon as the assignment has been accepted and the offer letter signed. Forward-thinking companies have the opportunity to start the process well before the move takes place.

Guided support and framed choices

What we value steers our behavior. While most people would say that sustainability and pro-environmental values are essential to them, not everyone acts on them accordingly. Research has shown, and our experience no doubt confirms, that there is often a gap between people's intentions and attitudes and their real behavior. People sometimes do things differently than they say. That is why providing guided support and framed choices increases the likelihood of positive outcomes in this project of using a move to promote habit changes. The guidance offered and how it is communicated should be more than one-directional, with the company or service provider being the only input source. Rather, the experience would indicate that companies would do best to encourage dialogue to help uncover potential barriers from the employee's perspective while enabling the employee to provide input and suggestions.

Moving is already a stressful time filled with countless small decisions for an employee to make. An effort should be made to avoid adding to this burden. Ideally, the most important decisions will be made even before the physical relocation (for example, decisions around housing, energy packages, or transportation), thus presenting the transferees with clear-cut choices with sustainable alternatives already built in.

In cooperation with Professor Bas Verplanken - ref. 1,2,3.

Three Crucial Parts Needed for Success

Companies must ensure that all the right elements are in place to drive long-term success in aligning global mobility strategies with sustainability goals. From clear policies that align with ESG objectives to comprehensive sustainability training and reliable relocation support, each plays a pivotal role in fostering sustainable employee behavior. The following highlights the three key components that, when effectively implemented, ensure that sustainability becomes a seamless and lasting part of the relocation process.

1. POLICY

Assignment policies will need to reflect the company's ESG goals and ensure sustainable choices to ensure all employees comply with them. It's important that Global HR takes an active role in implementing these policies, as it all starts or ends here!

2. SUSTAINABILITY TRAINING

It's equally essential that the employee both understands the need for sustainable preferences and is educated on how they can become part of supporting these efforts to the benefit of our planet. Making the employee invested in the opportunity has significant benefits and will ensure the longetivity of the employee's sustainability habits and preferences in decades to come.

3. RELOCATION SUPPORT

However, the above can only be achieved with an infrastructure to deliver and support sustainable choices on a global scale. This is where the relocation industry becomes an essential partner in the success of Global HR's goals. RMCs have, over many decades, built a global infrastructure of vetted suppliers. In the past years, their efforts have been to vet these same suppliers regarding their ability to deliver more sustainable services. Many RMCs have even "certified" their greener partners and built green programs around them to support Global HR's need for more sustainable assignments.

The Global Mobility service providers can solve the controlling aspects of mandating preferred choices. So it will be simpler to mandate choices via policies to obtain results than to incentivize via financial benefits.

Policy Aligned With Sustainability Goals

in cooperation with Mobility Mastery

Integrating ESG objectives into assignment policies enables companies to make significant progress in minimizing their environmental impact while ensuring global mobility aligns with broader business goals. Given that Scope 3 emissions account for a substantial portion of CO2 output, it is critical to adopt a comprehensive approach to global mobility, considering every phase of relocation.

Allowing assignees excessive flexibility, such as through lump-sum policies, often results in diminished control over sustainable decision-making and compliance. While assignee convenience is important, it doesn't always align with a company's environmental aims. Lump-sum policies can inadvertently set assignees up for challenges, as they may lack clear guidance on sustainable practices, thereby missing a chance to significantly contribute to the organization's CO2 emissions reduction.

To drive real change, businesses must guide assignees toward sustainable decisions by proactively embedding sustainable goals into every facet of the assignment. By doing so, companies can shift from merely adhering to regulations to becoming leaders in sustainable global mobility, positioning themselves competitively in the employer marketplace.

Below are a few examples of how sustainable options can be incorporated into assignment policies:

- **Eco-friendly moving services** that prioritize carbon-neutral shipping and sustainable packing materials.
- **Green housing allowances** that restrict options to energy-efficient or green-certified buildings.
- **Sustainable transportation options**, such as eco-friendly cars electric/hybrid vehicles, or public transportation instead of the traditional fossil-fueled cars.

"Incorporating corporate sustainability goals into assignment policies elevates the Global Mobility function's role within the organization. It is a strategic enabler, capable of driving long- term value for the business."

- Dennis Michels, Founder of Mobility Mastery

By integrating these sustainability-driven choices within the relocation package, companies not only offer more structured support but also gain better oversight in tracking and reducing Scope 3 emissions. While this approach may initially seem costlier than lump-sum options, the measurable CO2 reductions achieved help organizations avoid non-compliance penalties, bolster corporate reputation, and meet long-term ESG objectives, transforming sustainability from a perceived burden into an advantage.

Adopting a holistic sustainability approach across the entire relocation process offers further potential for businesses to lead the charge in environmentally responsible global mobility. This includes:

- **Pre-relocation planning:** Encouraging assignees to make environmentally friendly decisions from the start, such as selecting energy-efficient housing or opting for public transport. These early discussions established the groundwork for a sustainable assignment, aligning with both corporate and personal values.
- **Moving and shipping:** Using carbon-neutral methods and sustainable packaging materials.
- **On-site support:** Partnering with an RMC that can assist assignees in integrating sustainable behavior into their daily lives post-relocation, such as using renewable energy sources, engaging in local

This holistic approach throughout the relocation experience ensures that it becomes a fundamental part of the assignee's journey. By providing clear, guided choices, the process is streamlined, allowing assignees to focus on adjusting to their new surroundings with reduced stress and minimal family disruption, all while supporting corporate sustainability goals.

As companies push toward sustainable goals, RMCs have similarly evolved their roles too to assist with meeting these demands. By incorporating sustainable practices into their service delivery, RMCs can now help businesses meet sustainability goals through their partnerships with eco-aware suppliers and data-driven solutions. Some examples include:

- **CO2 savings reports** for each relocation, helping businesses track the carbon reductions achieved through sustainable practices.
- **Sustainability dashboards** that global mobility leaders can use to monitor ESG compliance and progress toward sustainability targets.
- **Collaborations with green vendors** who emphasize sustainability in all aspects of the relocation, from housing to transportation.

This added value not only supports companies in meeting environmental objectives but also improves the overall quality of relocation services.

Policy Creation Step by Step

Incorporating ESG goals into assignment policies elevates the Global Mobility function's role within the organization. Aligning these policies with the company's broader corporate strategy shows that global mobility is a strategic enabler capable of driving long-term value for the business.

It's time for everyone involved to make global mobility a force for positive change. With the right policy and suppliers, sustainability can become a core part of the assignment process, creating a better future for both businesses and the planet.

Are you excited after reading this but need help knowing where to start? Rest assured, below you will find a step-by-step plan for how to incorporate your company's sustainability goals into the assignment policy:

1. Align ESG goals with corporate strategy
- a. Ensure that your assignment policy is reflecting the company's ESG goals.
- b. Engage with senior leadership, including the C-suite and global mobility leaders, to create a unified approach that connects the assignment policy to the company's sustainability goals.

2. Conduct an ESG audit of current policies
- a. Assess your current policies to evaluate how well they align with sustainability objectives.
- b. Work with your RMC to identify opportunities for greener alternatives and areas for improvement.

3. Direct sustainable choices
- a. Incorporate mandatory requirements into assignment policies, focusing on:
  - i. Green housing options that meet energy-efficiency standards.
  - ii. Low-emission transportation options, such as electric vehicles or public transportation.
  - iii. Eco-friendly moving services that use carbon-neutral methods and sustainable packaging materials.

4. Partner with green vendors and RMCs
- a. Collaborate with RMCs that have robust sustainability programs and work with green-certified vendors.
- b. Ensure that your RMC can provide CO2 savings reports and other key data to measure your progress.

5. Leverage data-driven ESG reporting
- a. Use dashboards and emissions reports to track ESG goal progress, regularly reporting to leadership.
- b. Ensure that RMCs offer ongoing data on the carbon impact of relocations.

6. Educate assignees on sustainability
- a. Provide training programs to inform assignees about sustainable choices during their relocation (more details in the next chapter).
- b. Encourage the development of long-term sustainable habits that extend beyond the assignment period.

7. Monitor and adjust
- a. Continuously evaluate the effectiveness of your policies by gathering feedback from assignees, business units, RMCs, and vendors.
- b. Stay informed on the latest sustainability standards and make adjustments to policies as necessary.

Cultural Awareness & Sustainability Training

in cooperation with People Mobility Alliance

Many organizations declare ambitious sustainability goals at the corporate level, but have these commitments reached Global Mobility, and are they affecting how companies deploy talent globally? An AIRINC survey of 2023 with over 212 corporate participants revealed that many respondents planned to modify their mobility program to align with the company's sustainability initiatives. Even though sustainability initiatives were not their top priorities back then, they plan to increase their efforts in this area in the upcoming years.[(4)] People Mobility Alliance also observes a significant increase in demand for sustainability awareness training for internationally mobile employees.

Sustainability awareness training is foundational for integrating sustainable practices into Global Mobility and, most importantly, to help international assignees understand the broader context, not only about the role of the company within the whole business ecosystem and the impact of its business activities on the environment, but also how the individual actions of each employee matter. The primary strategy should be to develop comprehensive training programs educating the company stakeholders and assignees primarily on the environmental impacts of relocation activities and how everyone can play their role in the process of a positive change. For Cultural Sustainability Awareness training to be successful, it must be designed with the following key components in mind:

1. Customization and Relevance
The sustainability awareness training program needs to be flexible and designed to fit the specific sustainable goals of the company and the industry. Simultaneously, the program needs to address the regional cultural context. To remain relevant, the program should adapt to the organization's operations and the diverse locations where employees and assignees are based, ensuring that sustainability practices are effectively integrated into local contexts.

2. Immediate and Long-Term Focus
Sustainability actions should be approached with both immediate and future outcomes in mind. According to Professor Verplanken's research, sustainable habit formation is an ongoing process that begins prior to relocation, continues throughout the assignment, and extends into the repatriation phase. Therefore, training should span across all these stages to ensure lasting behavioral change and the long-term success of sustainability initiatives.

3. Structured and Timed Training
The training program should be organized into key modules and delivered at strategic milestones throughout the assignment. This phased approach ensures that all stakeholders are consistently aligned and equipped with the practical knowledge needed to embed sustainable practices.

"Sustainability awareness training is foundational for integrating sustainable practices into the Global Mobility industry and most importantly to help international assignees understand the broader context."

- Prof. Dr. Stefan Remhof, People Mobility Alliance (PMA)

4. Ongoing Support
Continuous support is essential for helping employees adopt and sustain new, eco-friendly habits over time. By offering guidance throughout the assignment and beyond, the program will help assignees to maintain sustainable practices long after their assignment ends, preventing them from reverting to old, less sustainable behavior.

"Helping the assignees to realize the differences in local approaches towards sustainability practices is essential for understanding the bigger picture and what individual effort each of them can make to contribute to a better future."

- Alexia Schmolling, Project Consultant, People Mobility Alliance (PMA)

Cultural Awareness & Sustainability Training

PRE-RELOCATION

Understanding Company Sustainability Goals & Industry Context - Pre-relocation module

The pre-relocation module aligns assignees with the company's sustainability goals and industry strategies, ensuring that all stakeholders understand the importance of environmental responsibility and how sustainability integrates into their business objectives. This module covers logistics, such as eco-friendly housing, sustainable transportation, and ways to reduce the environmental impact of the move. This training step helps assignees recognize the company's commitment to sustainability and how they contribute to these efforts, empowering them to make informed, responsible decisions from the start.

LOCALIZED PRACTICES

Localized Sustainable Practices & Actions for Expatriates - Right before relocation

Once assignees understand the company's sustainability strategy and its alignment with business goals, the focus shifts to educating them on sustainable practices and opportunities in their new location. This includes learning about local environmental regulations, cultural sustainability practices and how to reduce their personal and professional environmental impact. The key here is to make sustainability relevant to the assignees' new environment and to their regular operations. By empowering assignees with this knowledge, they can actively contribute to the company's broader sustainability efforts while adapting to their new surroundings.

AFTER RELOCATION

Contextualizing Environmental Impact Practically - Immediately after Relocation

This module takes place once the assignees are settled in the host country. The assignees receive practical guidance on aligning with both company and local sustainability goals. This module offers practical, location-specific advice, helping assignees understand the impact of their actions, such as the difference in terms of carbon footprint between commuting by train versus by petrol car. By focusing on high-impact areas and daily activities such as housing, energy use, waste management, recycling, and transport, assignees learn how their daily choices can contribute to reducing carbon emissions.

REPATRIATION

Repatriation & Long-Term Sustainability Commitment - Pre-repatriation module

The final module supports assignees as they transition back home, focusing on maintaining sustainable habits adopted during the assignment. Repatriation training provides advice on how to integrate sustainable practices into their home country's context, ensuring that the assignees' positive impact extends beyond the assignment itself. Continued support is offered through company sustainability networks, follow-up sessions, and access to resources that help assignees remain on the sustainable track long after repatriation.

By taking a holistic, long-term approach to sustainability training, companies can ensure that employees contribute to global sustainability efforts during their assignments and continue these practices throughout their careers. This comprehensive strategy benefits both the individual and strengthens the company's overall sustainability goals.

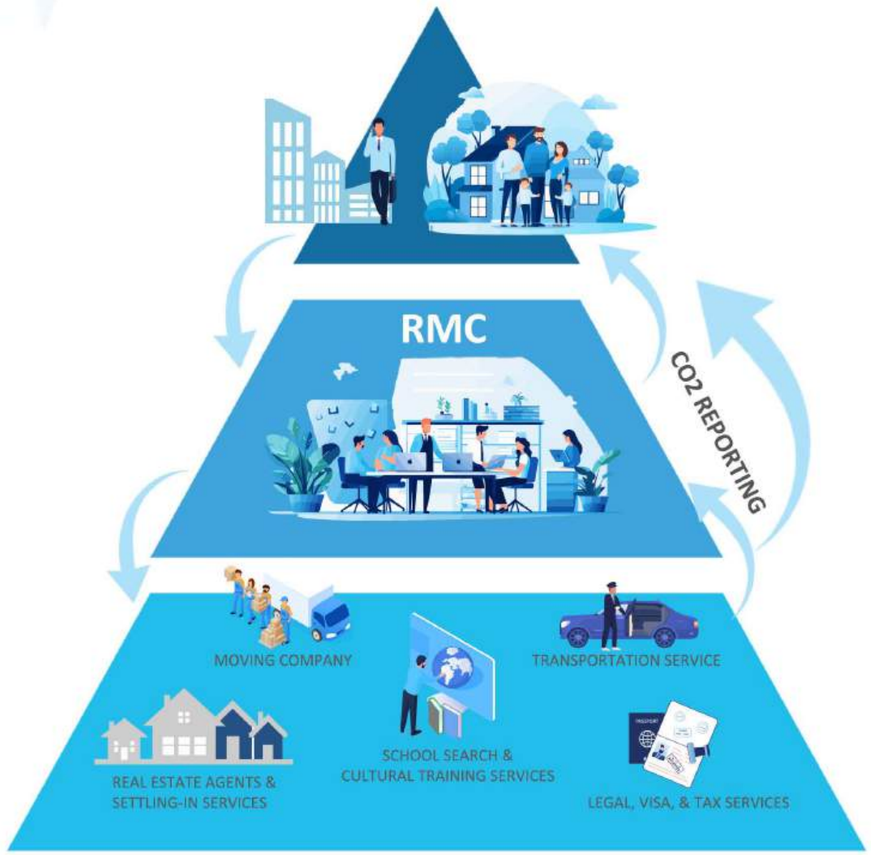
Outcomes & Benefits

Sustainability and cultural awareness training for international assignees offers a range of benefits, both for the organization and the individuals involved:

Sustainability is not a one-time effort; thus, gathering qualitative employee feedback through interviews or focus groups can provide insights into how the training has influenced their approach to sustainability and identify any barriers to implementing the practices. This continuous evaluation also helps iterate future training programs and monitor how exactly the sustainable actions reflect the overall well-being of the employees. At the end of the day, information and communication is key to empowering the business and assignees to make informed decisions. Effective communication relies on sharing information about the implications of decisions that are being made. However, that information is currently in short supply.

Relocation Support - Empowering the Assignees

Policies are in place, and assignees have been educated to understand their role, the role of the company, and its potential impact on the environment. Now, action has to be taken. Thanks to the industry-wide coalition for greener mobility and FIDI, WERC, EURA, IAM, and CHPA, the Global Mobility industry is taking steps to coordinate and amplify sustainability efforts across the global mobility ecosystem. With the RMCs orchestration, the Global Mobility industry is in a perfect position to accelerate its efforts to reduce its carbon footprint. With a more sustainable supply chain moving closer to complying with global standards, tailored solutions, and data-driven decisions, global mobility HR now has the mechanisms to steer their employees to more sustainable relocation.



In the locations where sustainable alternative providers are available, it is a natural next step to instruct the assignees to choose a sustainable direction. However, many people don't like being told what to do or being dictated to choices that might differ from their subjective preferences. What if there is a way mandates can serve for the benefit of the assignee without them feeling like they are dictated something? Imagine sourcing electricity and gas from an energy provider. You are offered to switch to a green energy alternative, enabling you to enjoy the same level of service you are used to but knowing that it pollutes less and is more sustainable. In that case, the individual does not need to sacrifice anything. And the environment is better off already. So, let's use the same logic to mandate specific sustainable alternatives where available.

Relocation Support - Ordinary Situations

Low hanging opportunity

In the field of sustainability, it's easy to focus solely on businesses as the primary polluters. However, reality underscores the significant influence of individual emissions, especially when emissions produced during an assignment add to the overall Scope 3 emissions. The focus is often placed on the initial move, such as moving household goods in trucks and shipping across oceans, flying assignees to their locations, and other related CO2 emissions. However, the move itself is just an initiation of the assignment lifecycle.

Global Mobility HR often overlooks the impact of the entire assignment lifecycle, including the seemingly small activities that each assignee does on a daily basis. These small daily activities are not insignificant - they are the low-hanging opportunity for emissions reduction. It's in these seemingly small things, like how we live, consume, manage waste, and move around, that our actions carry considerable weight.

U.K. households produce ~ 1t of waste per year. 80% is recyclable, but only 45% is recycled

3500 kWh ~ 1t of CO_2 needed for a family of 3 in U.K.

Driving 20,000 miles/y with AVG consumption of 8l/100km emits ~ 3.75t of CO_2

For reference see Appendix A and B

The use case on the previous page clearly demonstrates what potential there still is when talking about CO2 emissions reduction in our day-to-day lives. We often oversee the impact of these small daily activities on our overall carbon footprint. While most companies have limited control over the availability of green housing in the location or more sustainable overseas freight options, much more can be done to advocate for recycling programs or sustainable transportation (public transit, hybrids, EVs). Businesses shall direct their attention to helping the assignees understand their own impact better and support them in shifting their focus to taking immediate steps to reduce the carbon footprint.

Therefore, it's essential to partner with a relocation management company that can support and guide the assignee to make better choices.

> Do not wait for extraordinary circumstances to do good action; try to use ordinary situations.
>
> - Jean-Paul Richter, German writer and philosopher

Lump Sum = Sustainability Failure

Uncontrolled Choices or Guided Support

Relocation is no longer just about finding an employee a place to live and moving their belongings; it's an opportunity to align corporate actions with sustainability goals and demonstrate a genuine commitment to reducing emissions. To achieve this, organizations must rethink how they structure relocation policies. Leaving all move-related decisions to the assignee through a lump sum policy undermines these goals and misses the chance to create a positive environmental and employee experience.

Why does a lump sum approach fail from a sustainability perspective? Relocation is a major life transition, and employees need support to navigate it successfully while helping fulfill the company's broader objectives—including sustainability targets. A lump sum might seem appealing, giving employees flexibility while potentially saving the company money. However, without expert guidance, assignees often face decision fatigue as they try to manage housing, transportation, and settling-in services alone. This lack of direction not only diminishes their experience but also reduces the likelihood of eco-conscious choices, nullifying potential savings and amplifying stress.

Additionally, companies lose control over critical elements of the move when using a lump sum approach. Without oversight, tracking, or influence over suppliers and choices, businesses cannot measure emissions or ensure compliance with ESG goals—essential components of modern corporate accountability.

Why lump sum policies fail to support sustainability:

- **No Oversight**

  Companies lose control over spending, often leading to choices misaligned with sustainability goals.
- **No Support**

  Employees lack the guidance needed to make eco-friendly and strategic relocation decisions.
- **No Reporting**

  Without tracking data, businesses miss insights into emissions, sustainability, and cost efficiency.
- **Regulatory Compliance Risks**

  The absence of vetted suppliers can lead to non-compliance with ESG standards.
- **Talent Retention Challenge**

  Top talent may perceive lump sum packages as a lack of support, making them less likely to accept assignments.
- **Increased Stress and Lower Performance**

  Managing every aspect of relocation alone adds unnecessary stress, potentially affecting employee well-being and job performance.

To counter these challenges, companies should implement structured relocation policies with curated options prioritizing sustainability and employee satisfaction. Organizations can simplify the decision-making process by providing pre-selected, eco-conscious choices, reducing stress, and ensuring that relocations align with sustainability goals. This thoughtful approach transforms the relocation experience into a streamlined, supportive process that empowers employees and strengthens the company's commitment to a greener future.

Assignee Well-being & Sustainability Ambassadors

The Role of Sustainability Activities in Assignee Wellbeing

Training and educating employees shall lead to a better understanding of the context. And knowing what the options, opportunities, and limitations are. Understanding why and how to act more consciously in the context of our lives also fosters a sense of a positive social impact. When employees participate in sustainable practices—reducing waste, walking or taking public transport, supporting local eco-friendly businesses, or engaging in community projects—they develop a deeper connection to their new surroundings. This can also **improve their sense of belonging**, a key factor in reducing stress and anxiety in the new place.

Furthermore, employees who feel that their company supports sustainability often experience greater **job satisfaction and loyalty**, especially among younger generations.[5] Employees allowed to participate in or lead sustainability initiatives feel more connected to their company's mission and values. Sustainability gives work more meaning, making employees feel that their efforts contribute to something bigger than themselves. In a relocation context, this can be particularly powerful.[6,7]

Relocated employees often face uncertainty and stress, but when their company allows them to engage in sustainability efforts, it can create a positive emotional outlet that enhances their overall job satisfaction. Sustainable living encourages individuals to live more mindfully, **making decisions that benefit the planet and their physical and mental well-being**. This empowerment extends beyond the workplace.

When companies support relocated employees in adopting sustainable practices, they help create a sense of positive social impact, reduce stress, improve mental well-being, and increase job satisfaction. These efforts benefit the individuals involved and foster a culture of sustainability within the company, **ultimately leading to a more motivated, empowered, and satisfied workforce.**

> When people go to work, they shouldn't have to leave their hearts at home.
>
> - Betty Bender, Inspirational writer

To maximize the potential of sustainability initiatives, companies must go beyond simply offering these options; they should actively cultivate a culture where sustainability becomes a core part of employees' values and actions. By fostering this alignment, the company enhances individual well-being and job satisfaction and enables employees to serve as natural ambassadors for eco-friendly practices. When employees feel a personal commitment to sustainability—alongside the support and encouragement from their employer—they are more likely to take proactive steps that echo the company's sustainable values.

Sustainability Ambassadors

A **Sustainability Ambassador** is an individual who actively promotes and practices sustainability principles within their organization, community, or sphere of influence. They act as champions of environmental, social, and governance (ESG) initiatives, driving positive change by encouraging sustainable behaviors and decision-making. Sustainability ambassadors:

- Serve as **role models** by incorporating eco-friendly practices into daily life and work.
- Advocate for **awareness and action**, spreading knowledge about sustainability.
- Inspire others to adopt **sustainable habits** and align with broader organizational or societal goals.
- Act as **connectors**, bridging the gap between corporate sustainability strategies and individual or community-level implementation.

In a global mobility context, Sustainability Ambassadors are assignees who integrate sustainable practices into their expatriate assignments, influencing their colleagues, local networks, and communities in host countries. By guiding, educating, and supporting assignees, the Global Mobility industry can generate thousands of Sustainability Ambassadors each year!

Is it Better to Relocate or Not to Relocate?

In the earlier sections, we explored the broader context and key factors influencing the environmental impact of relocation. Now, let's address this question directly by using an analogy that aligns closely with our expertise: cars.

Consider battery electric vehicles (BEVs). It's often argued that producing BEVs, mainly due to their batteries, generates more CO2 emissions than manufacturing traditional combustion engine cars. This is true—initially. However, once a BEV is on the road, it begins to offset those higher production emissions. The more it's driven, the faster it reaches a breakeven point where its overall environmental impact becomes lower than that of a combustion engine vehicle. For instance, a Tesla Model 3 driven in the U.S. needs about 13,500 miles (21,725 km) to become cleaner than a Toyota Corolla. Still, in Norway, where electricity is largely hydro-powered, it reaches that point at just 8,400 miles. Many variables—battery size, energy efficiency, and the local energy mix—affect the timeline, but the principle remains the same: sustained use makes the difference. [8,9]

This same logic applies to the question of relocating employees. Moving an individual across continents is undeniably a carbon-intensive event. However, if that relocation fosters sustainable habits and a new, eco-conscious lifestyle, **the initial environmental cost can be balanced out during the assignment**. Within a few years, the overall emissions associated with the individual may decrease enough to balance out the initial impact. These new habits, sustained and adopted long-term—even after repatriation—**can result in a lasting positive environmental effect.**

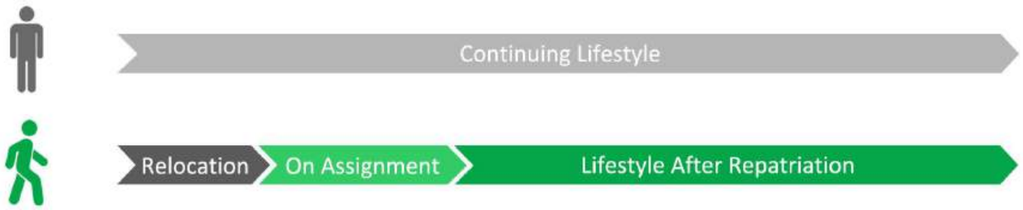
This highlights a critical point: under the right conditions, relocation can be more than just environmentally neutral—it can become a positive force for sustainability.

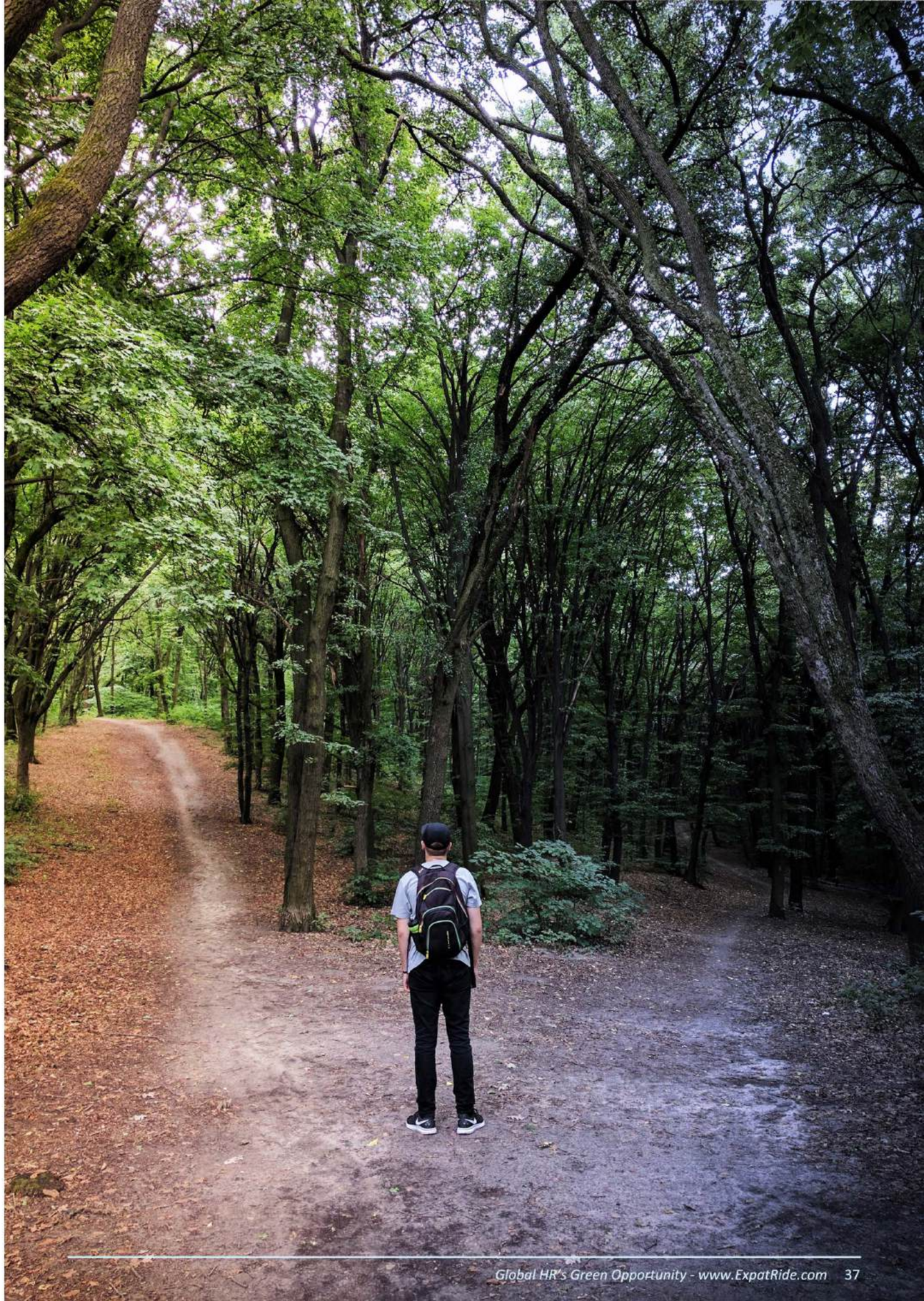
Causing Harm to do Good - The Electric Car

Electric cars have higher production emissions due to battery manufacturing, but they produce no tailpipe emissions. Typically, they become more eco-friendly than fossil fuel cars within 1-3 years of driving, making them a greener option over their lifetime.

Fast-Track Assignee to a Sustainable Lifestyle

Relocating a person may initially cause higher CO2 emissions due to travel and moving, but if the move leads to a more sustainable lifestyle, their overall emissions can decrease. Within a few years, this reduction can balance out the initial environmental impact, **making relocation positive for sustainability** in the long run.





Conclusion

A Unique Opportunity for Global Mobility

The Global Mobility industry stands at a critical crossroads, with an extraordinary opportunity to transform the way we relocate talent. As stewards of international assignments, **Global Mobility HR divisions hold the power to redefine relocation as a strategic catalyst for sustainability**. By integrating environmental, social, and governance (ESG) goals into every stage of the relocation process, HR leaders can turn what has traditionally been a logistical function into a strategic lever for corporate and environmental impact.

Relocation is more than moving employees—it's a moment of profound personal and professional change. This disruption, known as habit discontinuity, creates a unique opportunity for employees to break old patterns and adopt new, sustainable behaviors. When approached thoughtfully, **relocating employees might even have a lower environmental impact than leaving them in place,** proving that it can be better to relocate a person than not to relocate! Achieving this requires three key strategies:

1. Embed Sustainability into Policy Design

Relocation policies must actively reflect ESG objectives. HR divisions can align mobility programs with broader corporate sustainability commitments by incorporating green-certified housing, eco-friendly moving services, and low-emission transportation. These policies reduce environmental impact and set a powerful example for employees and stakeholders alike.

2. Equip Employees Through Sustainability Training

Tailored sustainability training ensures assignees are ready to embrace sustainable practices in their new locations. By addressing regional best practices, infrastructure, and cultural nuances, such training empowers employees to make meaningful changes that extend beyond the workplace and into their communities.

3. Leverage Relocation Management Companies (RMCs)

RMCs bring the expertise and global networks to streamline sustainable relocations. From sourcing eco-friendly suppliers to ensuring compliance with ESG standards, RMCs enable HR divisions to execute efficient and environmentally responsible relocations.

These efforts foster environmental stewardship and make organizations more attractive to top talent. Increasingly, **employees prioritize working for companies committed to sustainability and ethical practices**. By leading purposefully and demonstrating accountability, organizations can differentiate themselves in a competitive labor market, appealing to values-driven professionals eager to contribute to meaningful change and improve their well-being.

By adopting these strategies, Global Mobility HR divisions can redefine relocation as a strategic driver of corporate sustainability. **Beyond environmental benefits, sustainable relocations create engaged, forward-thinking employees who become *Sustainability Ambassadors***—spreading eco-conscious practices within their workplaces and communities.

The time for action is now. Every relocation offers a chance to align business objectives with environmental stewardship. By embedding sustainability into the heart of global mobility programs, HR leaders can position their organizations as industry trailblazers, demonstrating that the relocation process is not just a cost center but a powerful force for positive change.

As Global Mobility professionals, you have the tools, influence, and opportunity to lead this transformation. Together, let's reimagine relocation as a pathway to a sustainable future, proving that moving talent can also improve global sustainability while attracting and retaining the best minds for a brighter tomorrow.

EcoRide - Sustainable Transportation

At ExpatRide, we designed our EcoRide program to assist Global Mobility teams and relocation companies by providing a sustainable transportation solution that aligns with corporate sustainability goals. With an extensive vetted supplier network across 176 counties globally, EcoRide's goal is to ensure that international assignees will have access to transportation options and sustainable alternatives where available. With EcoRide, we help our partners align their transportation needs with sustainability mandates while simplifying the logistical complexity of managing global transportation services.

Tailored Sustainable Transportation

ExpatRide and our EcoRide Program offer tailored transportation services based on each client's location, needs, budgets, and sustainability requirements. Thanks to ExpatRide global network of vetted suppliers, we are able to provide high quality "concierge-like" service experience for the assignees with direct billing to the RMCs, which makes the experience smooth and seamless for all involved parties.

ExpatRide Services:

- **Rental Cars**: Access to car rental options, ensuring flexibility and convenience.
- **Airport Transfers**: Reliable transportation for assignees arriving and departing from airports globally.
- **Expat Car Leasing**: Long-term leasing of vehicles for assignees during their international assignments.
- **Daily Chauffeur Services**: Monthly/annually day-to-day travel with sustainable vehicle.
- **Bus & Coach Services**: Group transportation solutions.
- **Armored Vehicles**: Security-enhanced transport for high-risk environments.
- **VIP Services**: Exclusive, tailored transportation solutions for VIPs, combining luxury with sustainability.

CO2 Reporting and Scope 3 Accountability

As we see the growing demand for sustainable solutions at ExpatRide, we are working on implementing the CO2 reports to clients, detailing the emissions generated from transportation services and offering insights into reductions achieved through the use of sustainable transportation options. This data helps RMCs and HR departments to track their environmental impact, assess progress, and adjust their transportation plans to maximize sustainability. Transparency and accountability in carbon reporting are crucial steps toward achieving long-term sustainability goals.

The Process

The process of implementing an **EcoRide sustainable transportation plan** is designed to be seamless and straightforward. First, we work closely with clients to understand their transportation needs, sustainability objectives, and budgets. We then create a **tailored Transportation Plan** that aligns with the company's sustainability policies, offering a clear outline of eco-friendly transportation options available across all required locations. Our vetted suppliers ensure that all services adhere to the client's requirements and standards. Once the plan is finalized, we provide a step-by-step implementation guide, including supplier coordination, vehicle selection, and ongoing CO2 reporting. We support our clients throughout the entire process, ensuring a smooth and efficient rollout of sustainable transportation solutions worldwide.

Our commitment to offering eco-friendly transportation services, detailed CO2 reporting, and ongoing industry collaboration positions ExpatRide as an essential partner for companies aiming to enhance their environmental footprint. By choosing EcoRide, HR teams, and RMCs not only simplify the transportation process for assignees but also contribute to a more sustainable future, empowering businesses to make responsible choices that have a lasting impact on both the environment and corporate reputation.

Kudos to Our Collaborators

Professor Bas Verplanken

Professor of social psychology at the University of Bath since September 2006. He studied, graduated, and did his PhD (1989) at the University of Leiden, The Netherlands. From 1990 to 1998, he was an assistant and associated professor at the University of Nijmegen, The Netherlands, and from 1998 to 2006, a full professor of social psychology at the University of Tromsø, Norway. Bas Verplanken served as Associate Editor for the British Journal of Social Psychology from 1999-2004 and for Psychology & Health from 2007-2009.

Mobility Mastery

Mobility Mastery provides seamless, knowledge-based global mobility management for companies with or without an in-house team offering flexible, tailored solutions that handle all aspects of cross-border workforce operations, ensuring compliance, cost-efficiency, and improved employee satisfaction.

Dennis Michels, founder of Mobility Mastery, with over 25 years of experience in Global Mobility & Rewards across BIG 4 and in-house roles has been recognized with multiple HR leadership awards for optimizing global mobility processes and delivering significant cost savings. Awards such as 'Makes Bacardi faster, more effective and Efficient' in 2018, the FEM EMEA EMMA Award in 2019, HR Leader of the Year in 2021, the Global Mobility Most Admired Top 250 Corporate Professionals in 2022, and many more.

People Mobility Alliance

People Mobility Alliance (PMA) is an international consulting company with the goal to connect people across borders and cultivate global collaboration. PMA Consult specializes in providing strategic consulting services that focus on transforming businesses through a global mindset and an innovative technological ecosystem to improve organizational and people performance in today's interconnected world.

Prof. Dr. Stefan Remhof is the Managing Partner of the People Mobility Alliance and Professor of International Management at IU International University. He is a recognized expert in global mobility, expat management, and international assignments.

Alexia Schmolling is a Project Consultant at the People Mobility Alliance. As a business psychologist, her focus lies on expat management, employee wellbeing, and international HRM. She brings valuable insights from her various international experiences.

Jon Harman

Jon Harman is the founder of IN8WORK, a learning community designed by and for Global Mobility Professionals. With a deep understanding of the transformative challenges employees and their families face during work-related relocations, Jon established IN8WORK to foster collaboration, education, and shared expertise within the industry. The IN8WORK's learning platform allows the team to learn at the times and places that suit their lifestyle best, increasing the opportunities for engagement with the content.

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Appendices

APPENDIX A - Low hanging opportunity

When talking about the daily activities that are creating a considerable amount of CO2 emissions in the long term, we would like to highlight housing, waste management, and transport.

Take a model use case of an average Anglo-Saxon household of 3, living in the UK. According to the Department for Business, Energy & Industrial Strategy (BEIS), the average household in the UK used 3,509 kWh per year in 2021,[A1] where most of it was consumed by heating, water heating, and AC, followed by energy consumed by appliances and electronics, and last by lightning. But what does 3,509 kWh mean when discussing pollution and carbon emissions? First, we need to know the carbon intensity of the energy source. Coal-powered plants produce more CO2 per kWh as the coal is burned literally. Natural gas cuts the CO2e by half, and when the energy is generated by renewable energy sources (wind, solar, hydro), there might be little to no emissions.

According to European Environment Agency data, the CO2 emission intensity for UK 1 kWh is 0.281kg. That would mean that for 3,509 kWh, almost a ton of CO2 would be produced to cover the energy needed for this family of 3.[A2] When employing sustainable household solutions and practices like LED lighting, smart heating, energy-efficient appliances, better-insulated construction, etc., 10-30% of energy can be saved.

Consumption and waste management is another daily routine that represents huge potential and yet only a minor effort from the individual perspective. In 2021, the average UK household produced almost 1 tonne of waste. 80% of household waste is recyclable.[A3] However, only 45% of the total household waste was recycled.[A4] The power of recycling lies in the fact that GHG emissions from producing recycled materials are 37% lower than when production uses new “virgin” materials.[A5]

The final daily routine that can make a substantial change to emission reduction is the choice of transport when commuting regularly. Transport is one of the most significant contributors to the carbon footprint globally, with cars and vans accounting for approximately 48 % of emissions in the transportation sector in 2022.[A6] Promoting public transportation, walking, cycling, car sharing, or carpooling over private vehicle use is more sustainable and sometimes healthier and a more cost-efficient option in most cases. But it is not always the best solution for everyone.

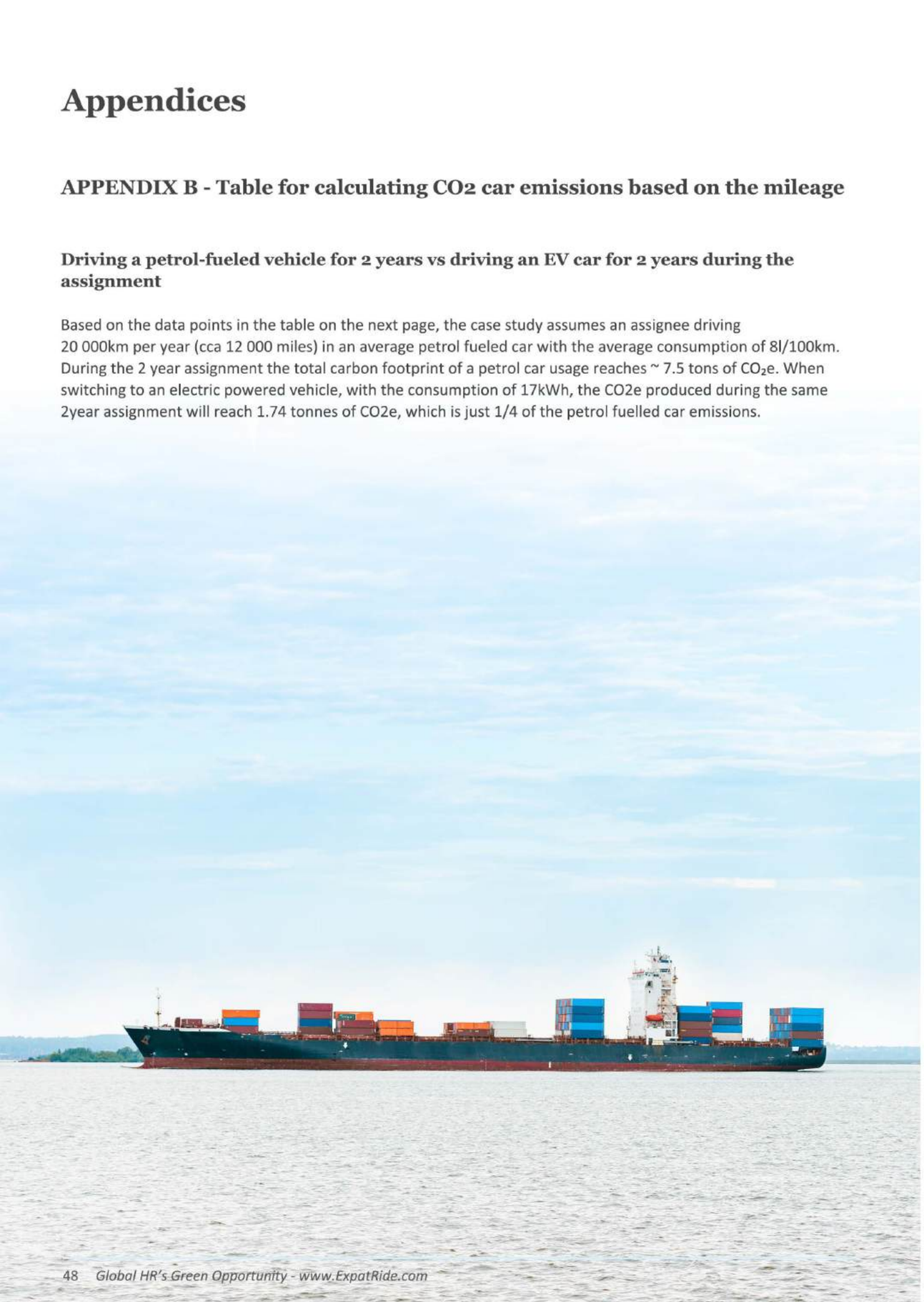
In locations with insufficient public transport systems, more time flexibility is needed, or one needs to move around more effectively with family or others who are taken care of, a car is simply a necessity. And that is where the transition to electric and other lower-emission vehicles occurs. If we look back to our use case, we see that the majority of UK citizens own one car.[A7] Assuming driving 12000 miles (cca 20 000km) with an average car consumption of 8l/100km, the carbon footprint can represent 3.75t of CO2. When switching to an EV car with 17kWh consumption and the exact mileage driven, the respective carbon footprint decreases by almost 77% to 0,87t of CO2e.

Appendices

APPENDIX B - Table for calculating CO_2 car emissions based on the mileage

Driving a petrol-fueled vehicle for 2 years vs driving an EV car for 2 years during the assignment

Based on the data points in the table on the next page, the case study assumes an assignee driving 20 000km per year (cca 12 000 miles) in an average petrol fueled car with the average consumption of 8l/100km. During the 2 year assignment the total carbon footprint of a petrol car usage reaches ~ 7.5 tons of CO_2e. When switching to an electric powered vehicle, with the consumption of 17kWh, the CO2e produced during the same 2year assignment will reach 1.74 tonnes of CO2e, which is just 1/4 of the petrol fuelled car emissions.



Average CO_2e Production by Vehicle Type

		consumption	kms driven	miles driven	total fuel consuption in liters	total fuel consuption in gallons	g CO2/ 1 l fuel	total kg CO2	trees (whole tree life)	trees per year
PETROL	low consumption vehicle	6 l/100 km	20,000	12,428	1,200	317,04	2348	2,818	3	282
		6 l/100 km	30,000	18,642	1,800	475,56	2348	4,226	4	423
	standard vehicle	8 l/100 km	20,000	12,428	1,600	422,72	2348	3,757	4	376
		8 l/100 km	30,000	18,642	2,400	634,08	2348	5,635	6	564
	SUV	10 l/100 km	20,000	12,428	2,000	528,4	2348	4,696	5	470
		10 l/100 km	30,000	18,642	3,000	792,6	2348	7,044	7	704
	sports car	20 l/100 km	20,300	12,428	4,000	1056,8	2348	9,392	9	939
		20 l/100 km	30,000	18,642	6,000	1585,2	2348	14,088	14	1,409
DIESEL	low consumption vehicle	4 l/100 km	20,000	12,428	800	211,36	2689	2,151	2	215
		4 l/100 km	30,000	18,642	1,200	317,04	2689	3,227	3	323
	standard vehicle	6 l/100 km	20,000	12,428	1,200	317,04	2689	3,227	3	323
		6 l/100 km	30,000	18,642	1,800	475,56	2689	4,840	5	484
	SUV	8 l/100 km	20,000	12,428	1,600	422,72	2689	4,302	4	430
		8 l/100 km	30,000	18,642	2,400	634,08	2689	6,454	6	645
	sports car	10 l/100 km	20,300	12,428	2,000	528,4	2689	5,378	5	538
		10 l/100 km	30,000	18,642	3,000	792,6	2689	8,067	8	807
ELEKTRO MIX	standard vehicle	17 kWh/100 km	20,000	12,428	3,400	898,28	256	870	1	87
	standard vehicle	17 kWh/100 km	30,000	18,642	5,100	1347,42	256	1,306	1	131
	SUV	30 kWh/100 km	20,000	12,428	6,000	1585,2	256	1,536	2	154
	SUV	30 kWh/100 km	30,000	18,642	9,000	2377,8	256	2,304	2	230
ELEKTRO ONLY GREEN/SOLAR ENERGY	standard vehicle	17 kWh/100 km	20,000	12,428	3,400	898,28	65	221	0	22
	standard vehicle	17 kWh/100 km	30,000	18,642	5,100	1347,42	65	332	0	33
	SUV	30 kWh/100 km	20,000	12,428	6,000	1585,2	65	390	0	39
	SUV	30 kWh/100 km	30,000	18,642	9,000	2377,8	65	585	1	59

Data sources: United States Environmental Protecion agency, European Environment Agency, and Smart Green Scan.

CO_2 absorption of a tree

The case of CO_2 absorption by a tree serves as an example to illustrate how many mature trees are needed to offset a certain amount of CO_2 For this White paper, we assume an average tree to absorb 10kg of CO_2e/year, meaning 1000kg of CO2 during an expected 100 years lifetime of a tree. Please consider that in defining an "average tree," several factors have to be taken into consideration, such as tree type, tree age and size, its condition, quantity of "leaves," and other factors. Moreover, a tree absorbs different amounts of CO_2 in various stages of its life based on maturity and conditions. Thus, the CO_2 absorption levels may differ in real life.

Disclaimer: The data used from the above sources are intended for inspiration and informational purposes only. Readers are encouraged to conduct further research and analysis before making any decisions or drawing definitive conclusions based on the data presented here. The white paper's contents do not constitute professional advice, and the authors, publishers, and contributors cannot be held liable for any errors, omissions, or damages arising from its use. Readers should independently verify the data and consult appropriate professionals for

Appendices

APPENDIX C - Debunking the BEV myths

When it comes to choosing whether to include electric vehicles in the global mobility strategy, the key considerations include the availability and accessibility of BEVs (battery electric vehicles) in different regions, the infrastructure needed to support BEV usage, and the cost implications of its operation for both the company and its assignees. These are all valid considerations. However, considering the BEV market expansion in the last years and its projected development, it is evident that BEVs are becoming the preferred sustainable transport choice for an increasing number of locations. Despite its growing popularity, there are many discussions about whether or not BEVs are good or bad solutions for people and the planet. As it happens, it is never "black or white," as it requires an understanding of the broader context and also the individual conditions and circumstances each of us is living in. That is why we want to dive a bit deeper under the surface and provide more clarity and context on the frequently discussed topics.

C1. BEVs Are Not Widely Available, and Its Charging Infrastructure Is Not Developed Enough

Availability

Indeed, the BEVs cannot compete in numbers with the incumbent ICEs (internal combustion engine vehicles), which have been on the market for decades. Electric vehicles have been present more or less for the past ten years, but over that time, their availability has accelerated considerably. The share of electric cars has been rising rapidly, from ~4% in 2020 to 18% in 2023. As of the end of 2022, the global stock of BEVs has been more than 25,900,000, and the fleet increased to 40 million in 2023.[(C1.1)] During that year, the battery electric vehicles emerged as the leading alternative to petrol/diesel cars within the EU, accounting for more than 14,6% of all new car sales, and[(C1.2)] the 2024 global projections data estimate new all-time highs reaching 17 million EVs sold.[(C1.3)]

When thinking about availability, it is important to look at the general trends and also the key markets where they are widely available already. Markets such as China, Europe, and the USA are leading examples and make it much easier to buy, rent, or lease and operate them.[(C1.4)] Yes, there are still many locations where the availability is lacking and the infrastructural support is not developed enough, however, at the above locations where an BEV is becoming a preferred choice for more and more drivers, it is worth considering this as an option.

Infrastructure

Infrastructure is a complex topic with no easy answer to a seamless solution. And the possibilities and conditions differ across the globe as well. Many drivers in the US can easily meet their charging needs by plugging in their BEVs at home as most BEVs are compatible with a regular 120V outlet. If you want to charge faster, a dedicated 240V outlet or a specialized charging station can be installed.

> *Electric vehicles can be plugged into the same type of outlet as your toaster! When you need to charge while on the road, you'll find over 72,000 stations and 196,000 EV charging ports in the U.S. available to the public.*[(C1.5)]

When it comes to charging on the go, the regulatory environment, namely the Bipartisan Infrastructure Law, is expected to accelerate access to BEV charging networks across the US rapidly. A $7.5 billion investment shall support the creation of a nationwide BEV charger network covering highways and neighbourhoods across the country.

In 2023, the public charging infrastructure went up by 40% globally, with fast chargers growing quicker than slow chargers. China deployed the most public chargers (for both slow AC and fast DC) and installed more than 85% of the world's fast chargers and 60% of slow chargers during the year. Europe reached more than 630,000 public charging points in 2023, with almost 30% added during the same year, and it is estimated that by the end of this decade, there shall be ~ 3.5 million public charging points across Europe. Interestingly, the Netherlands is a leading country with 160,000 chargers, and together with Germany and France, they account for more than 60% of the regional public charging infrastructure.[(C1.6)(C1.7)]

Is the charging infrastructure sufficient for the current number of BEVs being on the road? Probably. Would it be sufficient if the number of BEVs will multiply and no changes and investments will be made in the infrastructure? With a high probability not. Expansion, grid transformation, and capacity upgrade of the network are challenging on their own and would require a structural and systematic approach and further strategic planning and investments on various levels. Overcoming these challenges will require coordinated efforts from governments, businesses, and communities, as well as continued innovation and capacity-building.

C2. Cost of BEVs Are Too Expensive

Despite the general intention to purchase an BEV, which was up by a total of 9% year over year, affordability remains the top concern for potential buyers considering EV adoption in 2023 in the US.[(C2.1)] When examining how the prices of EVs have evolved historically, they are generally getting cheaper, not only due to battery price drop but also thanks to much more intensified competition. For example, last year, there were almost 600 EV models available on the market.[(C2.2)]

The price parity differs across different markets. In China, the sales-weighted average price of BEVs is already lower (even before subsidy). The IEA estimates that 65% of BEVs sold in China in 2023 were cheaper than their petrol counterparts. This means a 55% increase within 5 years. European market pricing differs across its countries and segments and varies quite significantly. For example, thanks to subsidies in Norway, BEVs have reached the cheaper point already. After phasing out the state subsidies for electric car purchases in Germany at the end of last year, the price has been affected accordingly, however, the overall competition might compensate for some portion of it. In other countries in the EU nonetheless, BEVs remain more pricey than the standard cars, that is a fact. When it comes to the US market, despite prices of BEVs going down and there are models (e.g., Tesla Model 3) that can be found in a range comparable to an average petrol car, they still remain more expensive on average.

> *For example, between mid-2022 and early-2024, Tesla cut the price of its Model Y from between USD 65 000 and USD 70 000 to between USD 45,000 and USD 55,000 in the US.*[(C2.3)]

Independent studies estimate that the pricing could get balanced over the 2025-2028 period; however, due to volatile commodity price development, global competition, other market forces, and changing regulatory context (including incentives and tariffs), it is hard to predict when will the next more favorable price shift happen.[(C2.4)]

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Total cost of ownership (TCO)

What generally catches the buyers' attention first is usually the retail price. However, from the "total cost of ownership" perspective, the focus shall go not only to the retail price of the vehicle but also to potential subsidies, operating costs (let it be insurance, fuel, or maintenance) but also depreciation. And good news is that the TCO of electric cars is continually decreasing.[C2.5] Furthermore what might be benefiting the TCO of EVs is not only volatile fuel prices, but also the introduction of low-emission zones that limit access for standard vehicles, and taxes and parking fees which the EVs are often free of.

So what do data say about the TOC of EVs vs ICE (internal combustion engine) cars? A study conducted across 16 European countries and in-depth analyses of their respective costs related to the TCO (initial selling price, taxes, maintenance, tires, insurance, and energy budget) concluded that:

> *"On average, the overall cost of operating a BEV consistently outperforms that of a comparable ICE. In fact, across the countries examined in this study, several scenarios strongly indicate that BEVs present a more cost-effective option."*[C2.6]

The study used a combined charging approach where 60% of charging was made at home, 30% at the workplace, and the remaining 10% in public places, performed over a representative basket of car models in a corresponding segment during a standardized lease contract of 4 years and mileage of 120 000 km. The biggest advantage in terms of operational costs was found to be the efficiency of electricity cost and generally lower maintenance. Compared to a petrol car, the BEVs typically incur only half of the energy costs. For example, a VW Golf driving 2500km every month in Germany will spend 233 EUR on fuel whereas the electric VW ID.3 spends 125 EUR, almost half for driving the same distance.

> *"The cost advantages of BEVs become more pronounced with an extended lease duration and increased mileage."*[C2.6]

C3. BEVs Are Not Sustainable at All

Many arguments supporting this statement usually start with the battery at the center of the discussion. When manufacturing an electric car, the additional energy and resources to manufacture the battery must be considered. Still, many studies prove that even though the initial carbon footprint for producing a BEV car (including the battery) might be higher than the one of a standard combustion car, its overall GHG emissions once the BEV is in operation will be lower due to zero tailpipe emissions.

For example, researchers at Argonne National Laboratory estimated emissions for both a gasoline car and an BEV with a 300-mile electric range. In their estimates, while GHG emissions from BEV manufacturing are higher, total GHGs for the BEV are still lower than those for the gasoline car.[C3.1] Sure, comparing BEVs to classical cars is a complicated process influenced by many factors, from car size, driving habits, fuel efficiency data, and energy type to calculation methods and even weather conditions. That is why different sources report the breakeven differently. However the results are clear, battery electric vehicles are more sustainable, especially the longer you drive them. Let us give you a few examples:

- "Over the lifetimes of the base models, BEV sedans, SUVs, and pickups emit approximately 40, 48, and 62 tonnes less CO2e than their ICEV counterparts."[C3.2]
- Carbon Brief analysis shows that: In the UK in 2019, the lifetime emissions per kilometre of driving a Nissan Leaf EV were about three times lower than for the average conventional car, even before accounting for the falling carbon intensity of electricity generation during the car's lifetime.[C3.3]
- An electric car and electric truck would need to drive 21,300 miles and 17,500 miles respectively to reach the break-even points with their gas counterparts. Considering most vehicles are driven 200,000 miles in their lifetime, that means the break-even point arrives after 1.5-2 years of driving.[C3.4]
- GHG emissions over the full lifetime of electric cars are significantly lower than for equivalent conventional cars running on fossil fuels. In 2020, a Commission study confirmed that the average EU lifecycle climate impact of a lower-medium range BEV was around 45% of that of a gasoline car and 53% of that of a diesel car. Their impact will keep decreasing as we continue to rapidly decarbonize our electricity mix.[C3.5]

Battery

And let's stay on the battery topic for a little longer. The lithium-ion batteries can represent 30-50% of the BEVs value and are the number one vital component of the vehicle. Between 2015 and 2022 the average battery size increased by 122% which means nowadays the batteries can endure more capacity loss before requiring replacement. Thus the battery life is longer with less need for replacement than before. So even though the life expectancy of batteries nowadays is longer than in the early days of BEVs, it is still hard to say 100% exactly how long the battery will last. The BEVs have not been around long enough to answer that surely and as almost 50% of the BEVs in operation were sold in the past two years, the real level of degradation data is simply not available yet. However, the manufacturers provide a guarantee of at least eight years or 100,000 miles.
A study examining ~ 15,000 BEVs from early models to newer ones released in 2023 revealed that battery replacements due to failure have been uncommon, averaging 2.5%, excluding large-scale recalls. Since modern BEVs were introduced in 2010, the battery technology advanced and have significantly improved reliability. Models produced since 2016, showed even lower failure rate of below 0.5%. Moreover the majority of these battery replacements would have been covered under the manufacturer's warranty.[C3.6]

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Another battery related criticism which might appear is "what happens with the batteries after their capacity stops being sufficient for the BEV car operation"? Even if the car industry might expect the batteries outlast the cars they are in, it is good to think what will happen next. An BEV battery reaches its end of life when its capacity decreases by 20-30% from its original level. However the fact that it is not suitable for an EV operation, does not mean it cannot serve other purpose. And BEV batteries being a resource-intensive component it is important to consider is repurposing opportunities. One of the promising use cases is using them in large-scale energy storage systems which can store excess energy for later use. Similar projects are being deployed already, one example is B2U Storage solutions who is giving second life to more than 1000 BEV batteries from Honda and Nissan and considering deploying battery pack of other brands.[C3.7] Nevertheless even usefully repurposed batteries will reach its final day, so the next logical step is recycling. Despite the fact that up to 80% of battery components are recyclable, recycling can only offset 10% of the materials needed by 2024, projections say. That is why it is crucial to speed up the battery recycling industry to reach its true potential.[C3.8] And the legislation might help with that as the EU is making battery manufacturers responsible for the handling of the battery at the end of its life according to environmental standards.

Recently the Mercedes-Benz factory opened Europe's first integrated battery recycling facility in Kuppenheim, Germany which, thanks to its innovative process, achieves a 96% recovery rate of valuable materials.

> *The facility is designed to process 2,500 tonnes of batteries annually, producing enough recycled materials to manufacture modules for over 50,000 new EVs. This innovative technology enables us to recover valuable raw materials from the battery with the highest possible degree of purity," said Jörg Burzer, Board Member responsible for Production at Mercedes-Benz Group AG.*[C3.9]

The facility is mechanically separating the components of the battery and with further hydrometalurgical treatment, the active materials with the precious metals (such as cobalt, nickel and lithium))are then refined for use in new Mercedes-Benz cars. Besides the components separation, within the initiative an extensive stationary storage applications have been developed to repurpose the batteries which are no longer fit for use in the cars. The facility is running on 100% green electricity and is net carbon neutral. The Mercedes-Benz AG is cooperating with three German universities with support of the Federal Ministry of Economic Affairs and Climate action. This particualr use case can be seen as a model example from a complex sustainability plan perspective, incorporating "value retention, closed-loop material systems and circular design concepts". All within achieving a profitable business model.

Electricity source

Some of us might point out, that the BEV drives as green as the source of its electricity. When the battery is charged from the grid where electricity is supplied from a coal power plant, that impacts the environment more than charging it from solar or wind. MIT's report conducted a study where they counted with the average carbon intensity of the U.S. power grid and found that a fully electric vehicle produces around 25% fewer carbon emissions than a comparable hybrid. But in Washington state, where hydropower dominates, the EVs emitted 61% less carbon than the hybrid cars. On the other hand, in coal-dependent West Virginia, the BEV generated more carbon emissions than the hybrid, although it still outperformed a gasoline-powered car.[C3.10]

C4. BEVs Have Short Driving Range and It Takes Too Long To Charge Them

Whether or not the BEVs range is sufficient relies on the average driving needs of the driver. The average daily driving needs of a US household are around 50 miles per day. In fact, about 85% of households travel less than 100 miles on a normal day. As most BEV models offer more than 200 miles of range on a full charge, and almost all new models can cover over 100 miles per charge the driving range should not be an issue for an "average driver". Moreover, car manufacturers are planning to introduce more long-range models in the near future so the range is expected to get higher.[C4.1] On the other hand, some factors, such as driving habits but also environmental conditions, might negatively influence an BEV's driving range. For example, studies have shown that in cold weather, the range can drop by ~ 40%, especially due to the use of heating systems.[C4.2]

As reported by IEA, *"with increasing battery size and improvements in battery technology and vehicle design, the sales-weighted average range of battery electric cars grew by nearly 75% between 2015 and 2023, although trends vary by segment".*[C4.3] In 2023, the average range for small cars remained around 150 km, slightly higher than in 2015, showing that this range is already adequate for urban driving. Larger, higher-end models, which already had above-average ranges in 2015, have seen little change through 2023, with their range holding steady at approximately 360-380 km.

How long does it take to charge an BEV?

The straight answer is, that it depends. The length of charging is dependent on a list of variables and thus even the answer might vary. Some manufacturers claim, that a fast-charger will get your battery to 80% in 30 minutes. Based on CarAndDriver tests, it was observed, that DC fast-charging times can get as low as ~ 26 minutes from 10 to 90 % in a Hyundai Ioniq or Kia EV6 GT, and as high as a bit above two hours in a GMC Hummer EV SUV, while the average is just around an hour.[C4.4] And to start from the top, there are three key factors impacting the charging time considerably: the battery size of the BEV, the charger capacity of the car, and also the power source.[C4.5]

Intuitively, the larger the battery the longer it might take to charge it, when we assume all other conditions are constant. However, the only constant in today's world is the changing conditions and as we know, as the car batteries, charging station types, and other conditions vary, we also have to consider certain "deviations" from the theoretically assumed numbers. Think about charging in a similar way as you would think about filling up a bucket with tap water. The size of the bucket but also the flow of the "tap" defines how fast the bucket will be filled up. The "tap" is the bottleneck and the ability to get filled up faster vastly depends on its flow, in other words, the water pressure. Which in the electricity terms can be translated into voltage.

Following North American standards, the common residential 120V AC outlet, also called Level 1, can take days (40-50+ hours) to charge a fully depleted battery pack of the BEV to 80%. For the Plug-in-hybrid, it can take approximately 5-6 hours. Level 2 charging stations charge at a higher- rate through 240V in residential or 208V in commercial applications. It is estimated it can charge the BEV battery in 4-10 hours, and the PHEV in about 1-2 hours.

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The typical power output ranges between 7-19kW. The fastest charging is ensured by the Level 3 fast charging stations which provide power output of 50kW - 350kW and estimated charging times of 20 minutes - 1hr for BEV.[C4.6] For example, Tesla's V3 Superchargers provide up to 250kW of charging power, meaning it can replenish 1000 miles of range per hour.[C4.7]

When calculating the charging time of the BEV, the calculation formula: **battery size (kWh) / charger power (kW) = charging time (hours),** shall be taken more as an approximate estimate. When considering deviations and other factors influencing the real-time of charging the battery electric vehicle, it also depends what is the status of the battery when you reach the charging station. Batteries are often made in a way to optimize their life and also limit the risks of overcharging. That is why when there is less than 10% of battery or more than 80% the charging slows down when being fast-charged, exactly for this optimization reason.

Not only a battery level but also the compatibility of the charging station and the vehicle might add up to this deviation. The charging point does not always reach its promised peak, and not every model can charge at the maximum charging power, as they are limited to lower kWh. In other words, if the charging station has a higher output than the vehicle charging rate, it will always default to the vehicle charging rate limit. On the other hand, if the charging point output is lower than the vehicle charging rate, it will allow only as much as the output offers.

Weather conditions shall also not be underestimated. Cold weather might result in slower charging times, taking it longer to reach full capacity due to increased internal resistance. On the other hand, hot weather might help with faster charging, however, the temperature extremes will more likely lead to faster degradation of the battery.[C4.8]

Before jumping to conclusions about the speed of BEV charging, it is better to narrow down what type and model of BEV the driver might be considering, the conditions and also the infrastructure available. With increased charging infrastructure and more fast chargers being deployed across EU, US as well as some Asian countries, time constraints during charging are becoming less of an obstacle.

Conclusion

With the ongoing technological progress, industry subsidies, ongoing infrastructural development but also increased competition in the field of BEV car manufacturers, the BEVs are becoming more available, affordable, and practical than ever and the situation is improving every day. The charging infrastructure is expanding rapidly, costs are gradually decreasing, and the driving range of BEVs is continually improving. Additionally, BEVs offer a more sustainable option for transportation, especially as renewable energy becomes more integrated into the grid. There never is one solution that fits all, but BEVs has clearly became one of the reasonable solution when it comes to sustainable private transport.

How We "Save" 29 Million Trees

37,600,000

Mature trees would offset the carbon footprint of driving a petrol car for 1 year by 100,000 assignees

376,000t CO_2

VS

8,700,000

Mature trees would offset the carbon footprint of driving an electric car for 1 year by 100,000 assignees

87,000t CO_2

Assuming driving 12000 miles (cca 20 000km) with an average car consumption of 8l/100km, the carbon footprint will represent cca 3.76t of CO2(for calculations see Appendix B). When switching to an EV car with 17kWh consumption and the same mileage driven, the respective carbon footprint decreases by almost 77% to 0,87t of CO2e.

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