

A novel approach for environmental management of dental practice: the “Plan-Do-Check-Act” model

Angela Rovera¹

¹ BDS, MSc, PhD, PGCERT, FHEA, National Secretary National Association of Italian Dentists (ANDI), Rome, Italy

Background

There is increasing awareness of problems associated with global warming but a lack of a systematic approach to deliver more environmentally sustainable dental care. Management change of the dental practice is necessary for progress and should be applied to create a culture of sustainability.

Aim

The aim is to suggest an environmental management change for the dental practice focusing on the objective of carbon footprint reduction.

Environmental management change design

The management change is based on the concept of “Plan-Do-Check-Act”, as recommended by the International Organisation for Standardisation (ISO) and described through the environmental aspects of the dental practice. The approach focuses on establishing and implementing environmental objectives, followed by monitoring results and taking actions to improve continually. The environmental aspects considered for the dental practice are activities causing an impact on the carbon footprint: energy use, travel, product purchasing, waste production, emission to air, water use, and contamination of land.

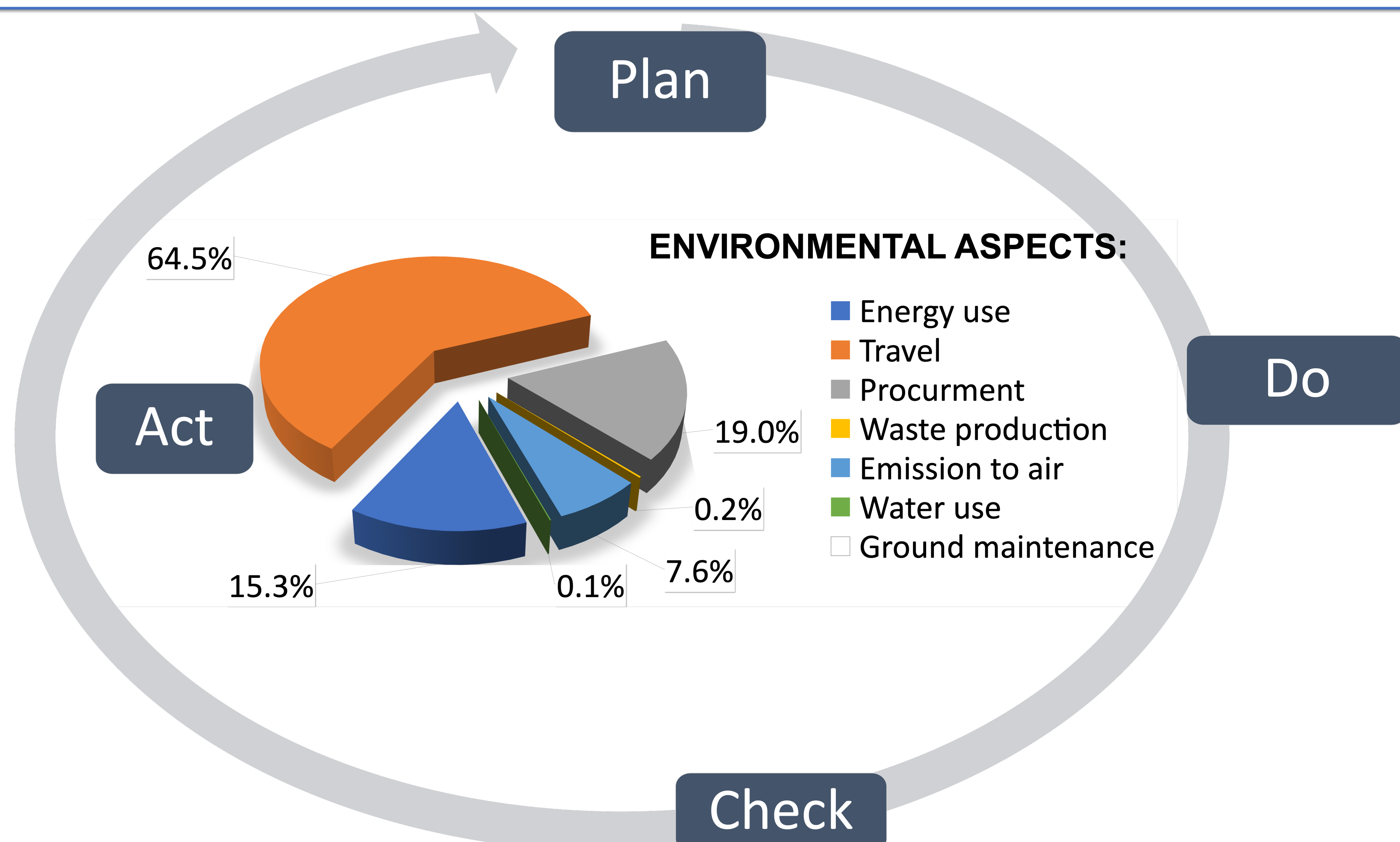


Figure 1. Environmental management change diagram. It shows the integration of the “Plan-Do-Check-Act” ISO 14100-2015 model with the environmental aspects of the dental practice to reduce its carbon footprint.

Conclusion

The “Plan-Do-Check-Act” ISO 14100-2015 model can be effectively integrated into the dental practice setting for its environmental management.

A reduction of the carbon footprint of the dental practice is achieved by applying the environmental management change described for each activity.

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Table 1. The “Plan-Do-Check-Act” model is described through the environmental aspects of the dental practice. The establishment and implementation of environmental objectives is followed by monitoring results and taking actions to improve continually.

	Plan	Do	Check	Act
Energy use	Choose sustainable energy, Improve energy efficiency, Prefer sustainable appliances, Use space effectively, Generate energy	Consider energy efficiency and renewable energy sources for construction (e.g., natural ventilation, led lighting, thermal wheels, optimised insulation levels, and renewable technology), Prefer energy-efficient technologies Turn off appliances when not in use	Energy Performance Indicator (EnPI- ISO 50001)	Develop energy monitoring and reporting processes, Control energy efficiency, Connect to other organisations to share resources
Travel	Reduce patients’ travel, Reduce staff travel	Combining appointments (i.e., family appointments, multiple procedures in one visit), Schedule dental examination by risk assessment approach, Employ technology for communication and professional interactions (i.e., teledentistry), Encourage active travel (i.e., cycling and walking, using public transport, car-sharing and electric vehicles) Provide electric charging point Prefer local products with the same delivery, and transported from the same logistics centre, Prefer the closest dental laboratory	Measure frequency of appointments and type of treatment by management software	Schedule dental examination by risk assessment approach, Personalise prevention on patients’ needs
Purchasing product	Prioritise products with low carbon footprints, Reduce waste	Appropriate stock management, Prefer sterilisable devices, Implement paper use reduction programmes, Reduce, reuse and recycle products	Record use of consumable for staff member	Prefer companies providing sustainable and ethical products, Influence manufacturers to be more environmentally sustainable, Form buying cooperatives
Waste production	Reduce waste, Proper segregation, Recycle	Use recycling waste bins in dental surgery, Follow waste best management practice (BMP), Prefer durable equipments, Reuse and upcycle equipments, Advise patients on safe disposal of pharmaceuticals, Compost food waste	Update a equipment maintenance register, Record of waste production by categories	Reduce waste generation, Segregate waste, Perform audit
Emission to air	Reduce travel for dentistry, Prefer sustainable procurement, Improve energy efficiency, Careful use of N2O	Follow actions related to energy, travel, procurement, waste and water, Capture and neutralise N2O	Follow monitoring of energy, travel, procurement, waste and water, Update register for N2O equipment maintenance, Monitor N2O staff exposure	Follow actions for energy, travel, procurement, waste and water, Implement educational programs to reduce N2O emission
Water use	Reduce water consumption	Switching off water-using equipment when not in use, Use a water-saving toilet, Collect rainwater in a water butt to water practice plants, Purchase water-efficient appliances, (i.e., dishwashers and sterilising equipment), Use low flow devices, Replace wet water vacuum pumps with dry pumps, Maintain equipment, taps and avoid leaks, Run autoclaves and practice laundry machines when fully loaded	Install meter for water use, Check for water leaks regularly	Increase staff and patients awareness placing stickers in the practice restroom and break area
Ground maintenance and biodiversity	Restore ecosystem, Promote biodiversity	Consider gravel or grass, Plant new trees, Avoid pesticides, Implement waste management by composting, Support reforestation campaign	Monitor biodiversity and ecosystem preservation	Engage staff with species survey